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A
PRIMER OF PHONETICS

SWEET

HENRY FROWDE, M.A.
PUBLISHER TO THE UNIVERSITY OF OXFORD

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A

PRIMER OF PHONETICS

BY

HENRY SWEET, M.A.

BALLIOL COLLEGE, OXFORD; HON. PH.D. HEIDELBERG

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PREFACE

THIS book is intended to supply the double want of a new edition of my *Handbook of Phonetics* and of a concise introduction to phonetics, with especial reference to English and the four foreign languages most studied in this country—French, German, Latin, and Greek.

The *Handbook of Phonetics* was published in 1877—at a time when the study of phonetics was confined to a few isolated specialists in different countries. Since then phonetics has made no progress in this country—has, indeed, rather gone back[1]—but has greatly developed on the Continent, where an extensive phonetic literature has sprung up in the last few years, especially in Germany—a literature which becomes more and more indigestible every year.

Under these circumstances, aggravated by my own want of access to speakers of foreign languages, I find it impossible at present to comply with the demand for a new edition of the *Handbook*. Even the compromise I now offer has not been undertaken without hesitation. Knowing the unsatisfactory results of 'paper phonetics'—getting up phonetics by reading the statements of others and attempting to harmonise their conflicting views—I have been obliged to exercise great caution in dealing with the latest phonetic literature.

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[1] Witness its total exclusion from the Modern Language Tripos at Cambridge.

It must not therefore be assumed that because I do not adopt a new view, I therefore reject it—it merely means that I have not had an opportunity of testing it by personal hearing.

So also by the retention of the main features of Bell's 'Visible Speech' terminology and notation—with the few modifications set forth in my *Sound-Notation* (*Phil. Soc. Trans.* 1880–1)—I by no means pledge myself to rigid conservatism. But I feel convinced that the path of progress lies through the Visible Speech analysis, and that the first duty of the very few who have a practical command of it is to do what they can to spread the knowledge of it.

Leaving theory and controversy and the details of less familiar languages to a future new edition of the *Handbook*, I have tried to make the present Primer as concise, definite, and practical as possible, rigorously excluding all details that are not directly useful to the beginner.

The only sound basis of theoretical phonetics is a practical mastery of a limited number of sounds. Some beginners start with an elaborate study of the physiology of the vocal organs—moving, perhaps, heaven and earth to get hold of a real glottis, or going in for the anatomy of the muscles of the tongue—so that by the time they come to real phonetic work they have no energy left.

Next to the power of forming sounds correctly and easily, and recognising them by ear, the most important requisite for the practical phonetician is facility in handling phonetic notation. Those who are inclined to grumble at the supposed difficulty of the 'Organic' (revised Visible Speech) notation here employed, may rest assured that such an alphabet can be learnt ten times over in the time it takes to get even a rudimentary knowledge of phonetics. The corresponding 'Narrow Romic' notation has been added only for the convenience of those who are debarred from the use of the Organic symbols. I have, on the other hand, made a more extensive use of the less accurate 'Broad Romic' notation, because this really supplies a want—which will some day perhaps be better supplied by a rationally constructed system of shorthand.

To make the book more generally useful, I have given some account of varieties of English and German pronunciation. The phonetic texts will afford opportunities of practical training in pronunciation. I will not apologise for the errors and imperfections of which I have no doubt thereby been guilty, except by saying that they are inevitable.

Want of space has obliged me to state my views of Latin and Greek pronunciation in a purely dogmatic form. The pronunciations given are those I habitually employ myself. As I consider it quite hopeless to attempt to restore the intonation of any dead language, I have simply put stress-marks for the Latin and Greek tones. My greatest difficulty has been with final *m* in Latin. As I feel convinced that Seelman's 'implosive-plosive voiced dorsal reduced *n* with simultaneous loose lip-closure,' could not possibly have existed as an independent sound in Latin or any other language, I have been obliged to return to my own theory (*Phil. Soc.*

Proc. 1882–4, xvii), although it is not supported by any definite statements of the Roman phoneticians. But it gives a workable pronunciation, in harmony with the development of the language and the structure of its verse.

As regards the objects and utility of phonetics, I will quote the beginning of the Preface to the *Handbook*: 'The importance of phonetics as the indispensable foundation of all study of language—whether that study be purely theoretical, or practical as well—is now generally admitted. Without a knowledge of the laws of sound-change, scientific philology—whether comparative or historical—is impossible, and without phonetics their study degenerates into a mere mechanical enumeration of letter-changes. And now that philologists are directing their attention more and more to the study of living dialects and savage languages, many of which have to be written down for the first time, the absolute necessity of a thorough practical as well as a theoretical mastery of phonetics becomes more and more evident . . . Again, if our present wretched system of studying modern languages is ever to be reformed, it must be on the basis of a preliminary training in general phonetics, which would at the same time lay the foundation of a thorough practical study of the pronunciation and elocution of our own language—subjects which are totally ignored in our present scheme of education.'

HENRY SWEET.

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INTRODUCTION.

1. PHONETICS is the science of speech-sounds. From a practical point of view it is the **art** of producing speech-sounds and recognizing them by ear.

2. It describes the actions and positions of the vocal organs—throat, tongue, lips, etc.—by which speech-sounds are produced, and classifies sounds according to their organic formation. This is the **organic** side of phonetics. The **acoustic** study of speech-sounds classifies them according to their likeness to the ear, and explains how the acoustic effect of each sound is the necessary result of its organic formation.

3. We see then that the word 'sound' has two meanings. When we talk of the sound *s* we mean (1) the shape of the throat and the position of the tongue by which it is produced, and (2) the hiss which is the result of sending the breath through the passage thus formed.

4. It is indispensable for the practical phonetician to cultivate both the organic and the acoustic sense: he must learn both to recognize each sound by ear, and to

recognize the corresponding organic position by the muscular sensations which accompany it.

5. We carry out these processes every day of our lives in ordinary conversation. All therefore that the phonetician has to do in the case of familiar sounds is to develope this unconscious organic and acoustic sense into a conscious and analytic sense. In acquiring unfamiliar sounds he has, on the other hand, to begin at the beginning. Before attempting to imitate the mechanism of a foreign sound, he must familiarize himself with its acoustic effect by careful and patient listening, so that the acoustic impression may correct and control his attempts to hit on the exact position for producing the sound. It is evident that the more exact his practical knowledge of the organic positions is, the more easy it will be for him both to find out the right position, and to fix it when once found. Again, the more familiar a sound is, the easier it is to gain insight into its mechanism. Hence the more careful our study of the familiar sounds of our own language, the easier it will be for us to acquire unfamiliar ones.

EMANCIPATION FROM SPELLING.

6. The first step is, to emancipate ourselves from the influence of our traditional spelling. Every one realizes that *rite*, *write*, *right*, *wright* all express exactly the same sound, and that *ow* in *bow-window* and *to make a bow* expresses two distinct sounds; but many have a difficulty in realizing that *father* and *farther*, *savour* and *save her*

have exactly the same sound in educated Southern English speech.

DIFFERENCES OF PRONUNCIATION.

7. Learn not only to recognize and tolerate differences of pronunciation, but to *expect* them. Remember that pronunciation is incessantly changing, and that differences of pronunciation between the older and the younger generation are not only *possible*, but *inevitable.*

8. Remember that language exists only in the individual, and that such a phrase as 'standard English pronunciation' expresses only an abstraction. Reflect that it is absurd to set up a standard of how English people *ought* to speak, before we know how they actually *do* speak—a knowledge which is still in its infancy, and can only be gained by careful observation of the speech of individuals, the only absolutely reliable observations being those made by a trained individual on himself.

9. Avoid, therefore, all dogmatism and hasty generalisations: be cautious in asserting that 'everybody speaks in such a way,' or that 'no educated man pronounces so.' Do not appeal to the authority of an imaginary 'correct' or 'careful' speaker.

10. Confine yourself to plain statements of facts. If people tell you that spelling reform is 'a pestilent heresy,' or that your London, Edinburgh or Dublin pronunciation is 'abominable,' do not argue with them.

ISOLATION.

11. Learn to pronounce every sound apart from its context. If you want to find out your natural pronunciation of any sound, utter it in some familiar sentence, several times over; then try to pronounce it separately without altering it in the slightest degree. Then test your command of it by pronouncing it in unfamiliar combinations, transposing for instance *king* into *ngik*. So also pronounce *hear* in *hear them* exactly as in *hear it*—that is, with a consonantal *r* instead of a mere voice-murmur. If it is a vowel, learn to lengthen or shorten, and to emphasize it without modifying it in any way. Thus, learn to lengthen the vowel in *bit* without making *bit* into *beat*. Again, lengthen both vowels in *pity*, and observe the difference between them. Isolate and lengthen the first elements of the diphthongs in *high* and *how*, and observe the difference (if any) between them.

ANALYSIS.

12. The next stage is, to learn to *analyze* the formation of these familiar sounds. This analysis must be practical. Theoretical knowledge is not enough. It is, for instance, no use being able to *explain* the difference between a breath consonant such as *f*, and the corresponding voice consonant *v*, unless we are able to *feel* the difference. Again, it is not enough to *hear* the difference: we must have a sense of the difference of articulation. Let the beginner learn to isolate and lengthen such a breath consonant as *f* in *life*—*fff*, and the corresponding voice consonant *v* in *liver—vvv.* He will soon find that while *f* is articulated in one place only—being the result of the friction of the outgoing air between the lower lip and upper teeth—*v* is articulated in two places—between lip and teeth, and in the throat. If he presses his first two fingers on the larynx or 'Adam's apple,' he will feel the vibration which produces the effect of voice in *v*, but not in *f*. If in pronouncing *v* he removes the lip from the teeth, he will hear the unmodified voice-murmur. If he does the same with *f*, he will hear the unmodified breath in the form of a scarcely audible sigh. He can then reverse these processes. If he breathes in the ordinary way, and brings the lower lip and the upper teeth together, he will produce an *f*; if he makes a voice-murmur, as in *err*, and brings lip and teeth together, he will produce a *v*. Let him do the same with other familiar pairs, such as *s* and *z*, hard and soft *th* in *thin* and *then*, till he feels the distinction, and has it thoroughly under command.

13. The great test of this command is the power of forming unfamiliar voiced sounds from familiar breath sounds, and vice-versa. Repeat *v*, *f* several times in succession, and then try to carry out a similar change with ʻ*l*; the result will be a sound which is essentially the Welsh *ll* in *Llangollen*. Carry out the same process with ʻ*r*, *n*, *m*, and *ng* in *king*.

14. Having thus mastered the fundamental distinction of breath and voice, the beginner must learn to feel the movements of the tongue and lips. If he passes from *ee* in *see* to *ah*, or *aw* in *saw*, he will feel that the tongue is moved backwards and downwards; if he reverses the process, he will find that the movement is upwards and forwards. Pronouncing *ee* by itself, he will then find that in its formation the fore part of the tongue is brought very close to the fore part of the palate—or, in phonetic terminology, that *ee* is a 'high-front' vowel. In the same way he will find that *aw* is a 'low-back' vowel, the root of the tongue being pressed down and brought near the back of the mouth, *ah* being a '*mid*-back' vowel. Again, in comparing *aa* with *oo* in *too*, he will find that while in *aa* the mouth is open, in *oo* the lips are brought together so as almost to close it—that *oo* is in phonetic language a 'rounded' vowel—a 'high-back-round' vowel. In time he will learn to measure more accurately the degrees of raising, lowering, retracting and advancing the tongue, and narrowing the lip-opening by which the different sounds are formed. Thus he will find that *ee*, and *a* in *name* and *man* are all three front vowels, but that in the second vowel the tongue is lowered from the 'high' *ee*-position to the 'mid,' while in the *a* of *man* it is further lowered to the 'low' position. So also he will find that the lip-opening of *o* in *no* is greater than in *oo*, while that of *aw* is greater than in *o*, the lip-opening being only slightly narrowed in *aw*.

ANALYSIS.

15. The foundation of speech is breath expelled by the lungs and variously modified in the throat and mouth.

16. Speech-sounds are generally formed with *out-breathing* or expiration (>), rarely with *in-breathing* or inspiration (<). The sounds known as *clicks* (90) are formed by the air in the mouth without either out- or in-breathing.

The Organs of Speech.

17. The breath passes from the lungs through the windpipe into the larynx. Across the interior of the larynx are stretched two elastic ligaments, the 'vocal chords.' They are firmly inserted in the front of the larynx at one end, while at the other they are fixed to two movable cartilaginous bodies, the 'arytenoids,' so that the space between them, the 'glottis,' can be narrowed or closed at pleasure. The glottis is, as we see, twofold, consisting of the chord-glottis, or glottis proper, and the cartilage glottis. The two glottises can be narrowed or closed independently. The chords can also be lengthened or shortened, tightened or relaxed in various degrees by means of the muscles they contain.

18. Above the true glottis, and still forming part of the larynx, comes the 'upper' or 'false' glottis, by which the passage can be narrowed or partially closed. On the top of the larynx is fixed a sort of valve, the 'epiglottis,' which in swallowing and in the formation of certain sounds is pressed down so as to cover the opening of the larynx.

19. The cavity between the larynx and the mouth is called the 'pharynx.' It can be expanded and contracted in various ways.

20. The roof of the mouth consists of two parts, the 'soft' and the 'hard palate.' The boundary between them may easily be found by pressing the forefinger on the palate and sliding it back till the palate yields to the pressure. The lower pendulous extremity of the soft palate, the 'uvula,' can be pressed backwards or forwards. It is pressed back so as to close the passage into the nose in the formation of all non-nasal sounds, such as *ah*, *d*. When the pressure is relaxed, the breath flows through the nose, as in ordinary breathing and in the formation of nasal sounds, such as *n*, or French *a* in *sang*.

21. The other extremity of the palate is bounded by the teeth, of which we must distinguish the 'edges' and the 'rim'—the place where they join the gums. The gums extend from the teeth-rim to the 'arch-rim,' behind which comes the 'arch,' whose front wall is formed by the 'teeth-roots' or alveolars. The middle part of the palate from the arch-rim to the beginning of the soft palate is called 'front.' The soft palate and the wall of the pharynx behind it constitute the 'back' of the mouth.

22. Of the tongue we distinguish the 'back' or root, the middle or 'front,' and the tip or 'point,' together with the 'rim' or edge of the tongue on both sides of the tip, and the 'blade,' which includes the upper surface of the tongue immediately behind the point. 'Lower blade' implies, of course, the lower instead of the upper surface of the tongue. Front, blade, and point are included under the common term 'fore.'

23. Besides the main positions indicated by these names, an indefinite number of intermediate ones is possible. The chief varieties are designated by the terms 'inner' and 'outer,' inner implying nearer the back of the mouth, outer nearer the teeth. Thus the 'outer front' of the tongue is a place nearer the point than simple front, and is therefore an approximation to the blade position.

24. Sounds are also modified by the degree of separation of the jaws, and by the movements of the lips and cheeks.

Throat-Sounds.

Breath, Voice, Whisper.

25. When the glottis is wide open, no sound is produced by the outgoing breath, except that caused by the friction of the air in the throat, mouth, etc. This passive state of the glottis is called 'breath,' and is symbolized by o, pictorial of the open glottis, whence is formed the 'breath modifier' :. The most important active states of the glottis are those which produce ‘voice’ and ‘whisper.’

26. Voice is produced by the action of the breath on the vocal chords in two ways: (*a*) If the glottis is entirely closed by the chords so that the air can only pass through in a series of extremely rapid puffs, we have that most sonorous form of voice known as the ‘chest’ voice or ‘thick register’ of the voice. (*b*) If the chords are only brought close enough together to make their *edges* vibrate, without complete closure of the glottis, we get that thinner quality of voice known as the ‘head’ voice or ‘thin register,’ which in its thinnest and shrillest form is called ‘falsetto.’ The symbol of voice is I, pictorial of the glottal chink. The ‘voice-modifier’ symbol is ;.

27. If the glottis is narrowed without vibration, ‘whisper’ is produced, which is symbolized by ɵ, as being intermediate between breath and voice. The ‘whisper-modifier’ ◗ is a curtailed ɵ. There are two degrees of whisper, the ‘weak’ and the ‘medium.’ (For ‘strong’ whisper see § 31.) In the weak whisper there is slight narrowing of the whole glottis; in the medium, which is the ordinary form, the chord glottis is entirely closed, so that the breath passes only through the cartilage glottis.

28. The popular and the phonetic use of the term whisper do not quite agree. Whisper in popular language simply means speech without voice. Phonetically speaking whisper implies not merely absence of voice, but a definite contraction of the glottis. In whispering as opposed to speaking aloud what happens is this:

Breathed sounds, being already without voice, remain unchanged. Voiced sounds substitute whisper (in the phonetic sense) for voice. If we pronounce 'vee' and 'fee' first aloud, and then in a whisper, we shall find that in 'vee' both consonant and vowel are altered, while in 'fee' only the vowel is altered, the consonant remaining breathed as in loud speech. It must, therefore, be understood in phonetic discussions that whenever we talk of a whispered sound, we mean one uttered with a definite contraction of the glottis. Whether we talk of a 'whispered *f*' or a 'whispered *v*' is indifferent: both names signify the 'lip-teeth whisper' consonant, the latter implying however a *substitution* of whisper for voice.

29. The acoustic distinction between breath and whisper is not very marked, but if we compare breathed and whispered *f*, we perceive clearly that the latter is, like the voiced *v*, a composite sound, being formed partly in the throat. Whispered sounds are also feebler than breathed ones, the force of the outgoing air being diminished by the glottis contraction.

OTHER THROAT-SOUNDS.

30. Glottal Stop (x). When the glottis is suddenly opened or closed on a passage of breath or voice, a percussive effect is produced, analogous to that of *k* or any other 'stopped' consonant. The most familiar example of this 'glottal stop' is an ordinary cough. The student should carefully practice the glottal stop in combination with vowels till he is able to produce x]ɨ and]ɨx as easily as (kaa) and (aak), taking care not to let any breath escape after the x in x]ɪ, as is the case in coughing. He should then learn to shut and open the glottis silently, and to know by the muscular sensation alone whether it is open or shut. It is easy to test the closure of the glottis by pressing the fore-finger on the throat above the larynx and tapping on its nail: when the glottis is open, this tapping produces a dull sound; when it is shut, the tapping makes a clear and hollow sound, like the gurgling of water poured into a bottle, and the pitch of this sound can be raised or lowered at pleasure by retracting or advancing the tongue. x forms an essential element of some languages, such as Danish, where, for instance, *hund* ɷɪ̊xɜ 'dog' is distinguished from *hun* ɷɪɜ 'she' solely by the 'stödtone' or x.

31. Wheeze. If we strongly exaggerate an ordinary whisper, we get that hoarse, wheezy sound known as the 'stage whisper,' or 'strong whisper' (ɵʌ). In the formation of this sound there is not only the glottis narrowing of the ordinary medium whisper, but there is also contraction of the upper glottis, and the opening may be further narrowed by depression of the epiglottis. If there is 'trilling' or vibration of the upper part of the glottis, we have the Arabic *Hha* ɵʒ, the voiced form of which is the Arabic *Ain* ɵʒ. ⟨ع⟩.

Vowels.

32. A vowel may be defined as voice (voiced breath) modified by some definite configuration of the superglottal passages, but without audible friction (which would make it into a consonant, § 64). The symbols of the different vowels are all formed by modifying the voice-symbol I.

TONGUE POSITIONS.

33. As each new position of the tongue produces a new vowel, and as the positions are infinite, it follows that the number of possible vowel-sounds is infinite. It becomes necessary, therefore, to select certain definite positions as fixed points whence to measure the intermediate positions.

34. The movements of the tongue may be distinguished generally as *horizontal* and *vertical*—backwards and forwards, upwards and downwards. The horizontal movements produce two well-marked classes, (1) 'back' (guttural) vowels, formed by the root, and (2) 'front' (palatal) vowels, formed by the fore part of the tongue. In the formation of back vowels, such as ʅ in *father*, ɟ in *fall*, the back or root of the tongue is brought into prominence partly by retraction of the whole body of the tongue, partly by pressing down the fore part of the tongue, the latter element of the articulation being apparently the most essential. In the formation of front vowels, such as ſ in *it* and ɩ in *man*, the tongue is advanced so that its front comes into operation. There is a third class of 'mixed' (gutturo-palatal) vowels such as the ɪ in *err*, where the whole tongue is allowed to sink into its neutral flattened shape, in which neither back nor front articulation predominates.

35. The vertical movements of the tongue, which are mainly effected by lowering and raising the jaw, produce various degrees of 'height,' or distance of the tongue from the palate. Thus in ſ the front of the tongue is raised as high and as close to the palate as possible without causing audible friction, or buzz. In [, as in *men*, it is somewhat lowered, and in ɩ it is lowered as much as possible. From among the infinite degrees of height three are selected: (1) '*high*,' as in ſ, (2) 'mid,' as in [, (3) 'low,' as in ɩ. These distinctions apply equally to back and mixed vowels, so we have altogether nine cardinal vowel-positions:

ɿ high-back	I high-mixed	ſ high-front
] mid-back	ʅ mid-mixed	[mid-front
J low-back	ɪ low-mixed	ɩ low-front.

It will be observed that we place the back vowels on the left side of the table, because the direction of the stream of breath by which sounds are formed is supposed to move in the same direction as in our ordinary writing, viz. from left to right, so that 'left' corresponds to 'back' in all phonetic diagrams and symbolization. Hence the 'vowel-modifier' is turned to the left in the symbols of back vowels (]), and to the right in those of front vowels (ſ), mixed vowels combining the back and front modifiers (ɪ).

36. In passing from ſ to [and ɩ there is not only lowering of the tongue, but the point of greatest narrowing is also shifted back progressively, the size of the resonance-chamber (60) in the front of the mouth being thus increased in both directions.

37. Intermediate positions between the nine cardinal ones are marked by diacritics: ˔ 'raiser,' ˕ 'lowerer,' ⊣ 'retracter,' ⊢ 'advancer,' ⊣˔ 'backward raiser,' ⊢˔ 'forward raiser,' ⊣˕ 'backward lowerer,' ⊢˕ 'forward lowerer.' Thus ſ˕ and [˔ both denote a vowel intermediate between the *i* of *it* and the *e* of *men*, viz. the second vowel in *pity* ɒſƱſ˕. So also]⊢˕ and ɪ⊣˔ both denote a vowel intermediate between the] in *but* and ɪ in *err*, as in the Irish and American pronunciation of *but*.

Rounding.

38. Rounding (labialization) is a narrowing of the mouth-opening by approximation of the lips. It can, of course, be combined with all the tongue-positions described above. It is symbolized by a line drawn across the vowel stem—f = French *u* in *lune*. There are three principal degrees of lip-narrowing, corresponding to the height of the tongue, high vowels having the narrowest, low the widest lip aperture. This is easily seen by comparing the vowels of such a series as the high-back-round ɨ in *good*, the mid-back-round ɉ in *no* and the low-back-round ɟ in *not*. It will be seen that in ɨ the lips are contracted to a narrow chink, while in ɉ the opening is wider and broader, and in ɟ only the corners of the mouth are contracted.

39. There are two kinds of rounding, *inner* and *outer*. In outer rounding—with which front vowels are rounded—the lips are brought together vertically. If the lips are separated by a finger and thumb upwards and downwards, it will be found impossible to form a front-round vowel such as f—the result will be ſ—the French *i*.

Back and mixed vowels, on the other hand, are rounded by lateral compression of the corners of the mouth and, apparently, of the cheeks as well. If a finger and thumb are put in the corners of the mouth so as to bear upon the cheeks about an inch inwards, and then expanded sideways, it will be found impossible to pronounce a back-round vowel such as Ɉ—the result will be a muffled form of the J in *father*. If, on the other hand, the lips are spread upwards and downwards during the utterance of such a vowel as Ɉ, it will still retain much of its distinctive rounded character. The distinction between inner and outer rounding is taken for granted in the ordinary vowel-symbols, as in f, ł. Where necessary they are expressed by the modifiers) for outer, ɒ for inner rounding. Thus J) is a muffled form of *a* in *father*, distinct from Ɉ = Jɒ.

40. The effect of rounding may be increased by projecting or 'pouting' the lips so as to form an additional resonance-chamber beyond the teeth. This action is generally avoided in English, but may be observed in Scotch, and generally in continental pronunciation, as in French and German. It is symbolized by adding the 'protruder' (ɔ), thus ɘłɔɑ = Scotch *book*.

41. The influence of the lips may also be observed in the unrounded vowels. In the formation of the high-front vowel ʃ in *it*, the sound is made clearer by spreading out the corners of the lips. So also to a less degree with the mid and low front vowels. But in a back vowel such as the J in *father* the lips tend to the neutral position of rest, although these vowels may also be made clearer by lip-spreading, which is symbolized by the addition of the 'spreader' ‖, as in ſ‖ = French *i*. In English the lips are less spread than in many other languages, such as French and German.

42. Although there is a natural connection between the height of the tongue and the degree of lip-narrowing —for it would be a waste of sound to narrow the back of the mouth and then allow the sound to diffuse itself in the fore part of the mouth; or to widen the back part of the voice-channel, and then muffle the sound by over-narrowing of the mouth-passage—there are many cases of *abnormal* degrees of rounding in language. We must distinguish between 'under-rounding' and 'over-rounding.' Under-rounding implies a *less* degree of rounding than is normally associated with the vowel's height, as when a high vowel is formed with the rounding of a mid or low vowel; it is symbolized by adding the inner rounder ͻ to the symbol of a back, the outer rounder) to the symbol of a front vowel. Thus Ɩͻ is a combination of the tongue position of the ɨ in *good* with the lip-position of the ɉ in *no*—a sound which seems to occur in the dialects of the North of England. Over-rounding implies a *greater* degree of rounding than normally belongs to the vowel's height; it is symbolized by adding the rounder to the symbol of the normal rounded vowel. Thus ƒ), as in German *über*, is the mid-front vowel with the rounding of the high front f; it is a compromise between the French vowels ƒ, as in *peu*, and f, as in *lune*. Degrees of abnormal rounding may be discriminated by the addition of the raiser and lowerer (37); thus lɒ⊥ implying mid, and lɒ⊤ low rounding.

NARROW AND WIDE.

43. These are important general modifications of all vowels. The narrow vowels are symbolized by a 'dot-definer' (ſ), the wide by a 'hook-definer' (ſ). The 'narrow-modifier' ᶺ and the 'wide-modifier' ᵥ are formed from ʌ and v (70). The distinction depends mainly on the *shape* of the tongue. In forming narrow vowels there is a feeling of tenseness in that part of the tongue where the sound is formed, the surface of the tongue being made more convex than in its natural 'wide' shape, in which it is relaxed and flattened. This convexity of the tongue naturally narrows the passage—whence the name. The narrowing is the result not of raising the whole body of the tongue (with the help of the jaws), but of 'bunching up' that part of it with which the sound is formed. Hence if we take a low-wide vowel, such as the low front-wide ɩ in *man*, we can raise it through the ɾ in *men* to the high position of the ſ in *it* without its ever running into the mid-front-narrow ɾ in French *été*. So also ſ may be raised till it becomes a consonantal buzz without ever passing into the high-front-narrow ſ in French *si*—that is, as long as the tongue retains the laxity and comparative flatness of a wide vowel.

44. The distinction between narrow and wide is not so clear in the back vowels, where the convexity of the tongue seems to be accompanied by tension and consequent advancing of the uvula.

45. It is, of course, possible for a vowel to be exactly half way between narrow and wide, which is symbolized by adding the wide modifier to the narrow vowel symbol, thus ſ꞉=half wide *i*, as in Norwegian *fisk*.

NASAL VOWELS.

46. In the formation of nasal vowels voiced breath flows through the nose as well as the mouth (20). If the nose passage is kept only slightly open, we get the 'nasal twang' of many American and some English speakers, which modifies all the vowels impartially, although, of course, it is more audible in the opener vowels than in the close high ones. In languages which distinguish between nasal and un-nasal vowels the nose-opening of the former is necessarily more marked than in a mere nasal twang. It is especially marked in French, where the nasal vowels in such words as sɟʾ *sang*, >ɩʾ *vin* are very sonorous. The nasality-modifier is supposed to be pictorial of the pendent uvula.

OTHER MODIFICATIONS OF VOWELS.

47. Vowels may be uttered simultaneously with several of the consonants. Thus, if we put the tongue in the *l*-position (69 *b*), we shall find little difficulty in articulating almost any vowel, although, of course, the back vowels are the easiest. Most of these consonant-modified vowels are of little practical importance. But there are classes of *point-modified* vowels which deserve notice. They are symbolized by the addition of the 'point-modifier' ˎ. The English point-consonant ω in *starry* is in itself almost a vowel, and if we carry the raised tongue-point position by which it is formed into the preceding vowel, we make sʊ]ɪωſ˗ into sʊ]ɪ\ωſ˗. If the point is turned back or 'inverted' (71 *c*), we get]ɪ\c with a peculiar 'snarling' effect, common to most of the dialects of the south-west of England, and heard in such words as *hard*, *sir*.

BREATHED AND WHISPERED VOWELS.

48. If an open vowel such as] is uttered with gentle breath instead of voice, we get a scarcely audible sigh, in which however the characteristic effect of the vowel is still audible. If we take a high vowel such as ſ in *bit*, the friction of the breath is clearly audible, and still more so in the narrow ſ. So also with ł and ł, which when devocalized, sound like a weak *wh* (72). In French this devocalization of high vowels is frequent, as in ɭˢsſ: *ainsi*. Voiceless vowels are indicated by the addition of the breath-modifier :.

49. Whispered vowels, which are indicated by the addition of the whisper-modifier ▸, are common in some languages, such as Portuguese, where *Oporto* is pronounced ł·ɒ'}ωˢʊ'ł▸. They may sometimes be heard in unstressed syllables in English, as in ʊɭ▸·əɭvɭ *together*.

TABLE OF VOWELS AND GENERAL REMARKS.

50. The thirty-six elementary vowels are given in the annexed table, with key-words from English (E.), Scotch-English (Sc.), American-English (Amer.), French (Fr.), German (G.), and other languages.

high-back-narrow A. Gael. *laogh*.	high-mixed-narrow I. Welsh *un*.	high-front-narrow i. Fr. *si*.	high-back-wide *a*.	high-mixed-wide *ɪ*. pretty.	high-front-wide *i*. bit. *see* pity, fear.
mid-back-n. a. *but*.	mid-mixed-n. ë. G. gabe. Amer. *earth* I.	mid-front-n. e. G. *see*. Sc. *say*. Dan. *se*.	mid-back-w. *a*. father. Dan. *mane*.	mid-mixed-w. *ĕ*. *eye*. *better*.	mid-front-w. *e*. men. *say*
low-back-n. ʚ. Cockney *park*.	low-mixed-n. ä. *sir*.	low-front-n. æ. Swed. *lära*.	low-back-w. *ɒ*. Swed. *mat*.	low-mixed-w. *ă*. how. Port. *cama*.	low-front-w. *æ*. man.
high-back-n.-round u. Fr. *sou*. Sc. *book*. Swed. *upp*.	high-mixed-n.-round. ü. Norw. *hus*. Swed. *hus*.	high-front-n.-round y. Fr. *lune*.	high-back-w.-round *u*. *put*. *too*	high-mixed-w.-round *ü*. *value*.	high-front-w.-round *y*.
mid-back-n.-r. o. G. *so*. Swed. *sol*.	mid-mixed-n.-r. ö.	mid-front-n.-r. ə. Fr. *peu*. G. *über*.	mid-back-w.-r. *o*. G. *stock*. boy. no	mid-mixed-w.-r. *ŏ*. Fr. homme. follow	mid-front-w.-r. *ə*. Fr. *peur*.
low-back-n.-r. ɔ. *law*. Swed. *så*.	low-mixed-n.-r. ɔ̈.	low-front-n.-r. œ. Swed. *för*.	low-back-w.-r. *ɔ*. not.	low-mixed-w.-r. *ɔ̈*.	low-front-w.-r. *œ*. G. *götter*.

51. In naming the vowels 'height' comes first, and 'rounding' last—'high-back-narrow-round,' etc.

52. In the 'narrow Romic' notation wide vowels are expressed by italics, mixed by dots.

53. A practical mastery of the vowels can only be acquired very gradually, and by beginning with those that are already familiar (5). Foreign sounds are best learnt in connection with a general mastery of the language in which they occur. When the learner finds that intelligibility depends on what seem to him almost inappreciable distinctions, he is forced to learn to recognise and imitate them. A practical mastery of sounds implies the power of uttering them accurately and without hesitation or effort—above all, without any facial contortions—till at last the correct pronunciation becomes a matter of pure habit, and is preserved even in the most rapid speech. Few learners can really master half-a-dozen new vowels in less than six months, so that it is quite worth while making a general study of the grammar and vocabulary of the language in which they occur.

54. Whispering the vowels is a great help in analysing their formation. After a time the student will be able to recognise each vowel solely by the muscular sensations associated with its formation: he will be able to say to himself, 'now my tongue is in the position for ɩ, now I have changed it into the Ɩ-position,' etc., while not uttering the slightest sound, confident that if whispered or voiced breath is allowed to pass through the mouth, the required sound will be produced.

55. The tongue positions may be compared in various ways. It is very instructive to run through a whole series vertically or (what is more difficult) horizontally, shifting the tongue with uniform speed from one extreme to the other, thus: ʃ, ʃ˔, ʗ, ʗ˔, ɩ, ɩ˔ and back again; ɩ, ɩ˧, ɪ, ɪ˧, J, J˧ and back again. It is also important to acquire the power of rounding and unrounding at will. It is very easy to learn to round the front vowels on the pattern of the already familiar back round vowels, thus ɟ:ɉ : :ʗ:ꞓ, the substitution of outer for inner rounding being made instinctively. In rounding the mixed vowels, be careful to retain the inner rounding of the back vowels: remember that ƫ is nearer in sound to ɉ than to ꞓ. Unrounding should be practised first on the front-round vowels, then on familiar pairs of back vowels, such as ɉ:ɟ. The lips should at first be spread by the finger and thumb (39). The most difficult vowels to unround are the high back ƚ and ɨ.

56. The use of these different processes in acquiring unfamiliar sounds is self-evident. They may be used to check one another. Thus, if the student has learnt to form J from ɟ by lowering the tongue, he can also unround the Ɉ in *not*, and if both operations are correctly performed, they will yield the same, or very nearly the same sound.

57. We say 'very nearly the same sound,' because it is only occasionally that a key-word gives exactly the sound indicated by an unmodified symbol such as J or Ɉ. Not only are key-words ambiguous through the various divergencies of pronunciation classed as provincialisms, vulgarisms, individual defects, and the inevitable change from generation to generation, etc., but also because every language tends to shift its sounds a little, often in order to make them more distinct—to avoid confusion with some other sound. Even in the same language pairs of rounded and unrounded vowels are often formed with slightly divergent tongue-positions, as we see exaggerated in G. *i* and *ü* (296). The student must therefore learn to form the thirty-six vowels independently of the associations of their pronunciation in special languages. To him ſ˔ is that vowel which is the result of bringing the convex front of the tongue as near the palate as possible without producing consonantal friction, and [is the result of a position exactly half-way between ſ˔ and ɭ˕, the latter being the result of lowering the tongue as much as possible. In practice such symbols as ſ and [stand for a group of infinitesimally different sounds, to be differentiated, if necessary and practicable, by diacritics—ſ˕, [˖, [˖˕, etc.

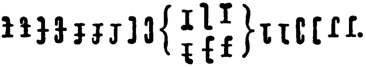
ACOUSTIC QUALITIES OF VOWELS.

58. We have hitherto ignored the acoustic effects of the vowels. This has been done designedly. The first and indispensable qualification of the phonetician is a thorough practical knowledge of the formation of the vowels. Those who try to learn new sounds by ear alone, without any systematic training in the use of their vocal organs, generally succeed but partially.

59. The test of 'a good ear' is the power of discriminating and recognising sounds. This is an indispensable qualification for those who wish to write down sounds from hearing, and should be carefully cultivated by all students of phonetics. In learning foreign sounds the habit of patient listening should be cultivated before everything. No attempt at imitation should be made till the acoustic impression has been fixed. Otherwise the student hears his own imperfect imitation as much as the correct sounds. It is important to hear the same sound pronounced by different voices. Hence the advantage of learning sounds in the country where the language they occur in is spoken. In his daily practice of portions of the vowel-table, the student should sometimes whisper the vowels, sometimes utter them in a loud voice, and compare the sounds of those that are most like, till he can distinguish them.

60. It will soon be observed that vowels whose formation is distinct are often very similar in sound. This will be better understood if we consider that a vowel is, acoustically speaking, voice modified by a resonance-chamber, viz. the mouth. Every time we move the tongue and lips we create a new resonance-chamber which moulds the voice into a different vowel. Every vowel can have its pitch raised or lowered by varying the length of the vocal chords, as when a scale or a chord is sung on one vowel. But each vowel has besides an inherent pitch of its own, due to the shape and size of its resonance-chamber. Thus, if ſ, J, and ɨ are all sung to the same note, we hear how much deeper ɨ is than J, while J is much deeper than ſ. The best way of hearing the inherent pitches of the vowels is to whisper them, for the pitch of whisper being invariable, the differences caused by the resonance are clearly heard. The connection between the shape and size of the resonance-chamber and the pitch is self-evident. Thus I owes its high pitch to its being formed by a narrow channel in the front of the mouth, while the pitch of J is lowered by the greater size of its resonance-chamber, and that of Ɨ by the narrowing of the lip-aperture, both J and Ɨ being formed in the back of the mouth, which, of course, gives them a deeper and more hollow sound independently of other influences. The wide forms of the front and mixed vowels are lower in pitch than the narrow ones, because of the greater width of the mouth cavity in the case of the wide vowels; but in the case of the back vowels the narrows have the lower pitch, because they retract the tongue more.

61. The exact pitches of the vowels have not yet been determined; we have not even got so far as to arrange them in the order of their pitches. The following is Mr. Bell's order of the pitches of some of the chief vowels, beginning with the lowest, vowels having the same pitch being bracketed together:

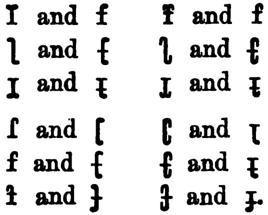


The pitches of the back vowels offer the greatest difficulties, especially in the back-rounded vowels. Thus an increase in the *force* of the whisper will raise the pitch of ɿ from one to two tones, by throwing the sound forward to the lips. But if we whisper the last six front vowels, we can hear that they rise uniformly by a semitone, making a chromatic scale.

62. It is evident from the table that the same pitch may be produced by different modifications of the same resonance-chamber. Thus, if we start from ʃ, we can lower the pitch either by retraction of the tongue, giving I, or by rounding, which gives f, and consequently I and f have the same pitch, the retraction of one vowel being equivalent to the rounding of the other, and they are so like in sound that those who hear I for the first time often take it for a round vowel. Hence also the tendency to confuse English ɪ in *err* with an open sound of German *ö* or French *eu.*

63. It is also important to observe that such pairs as ſ and [, ɿ and }, are as near in sound as ſ and ʃ, ɿ and ʅ, the order of pitches being [, ʃ, ſ and ʅ, ɿ, }. The explanation is precisely analogous to that of the similarity of I and f, namely that the pitch of ʃ is deepened by increasing the distance between tongue and palate, and so enlarging the resonance-chamber, and that this can be effected either by flattening the surface of the tongue, as in ʃ, or by lowering the whole body of the tongue, as in [. ſ and [are very similar in sound, and some foreign phoneticians still ignore the difference, denoting ſ and [etc., by the same sign. Raised [˔ has the same pitch as ʃ, from which it can hardly be distinguished when short.

We have then the following pairs of vowels very like in sound:



Consonants.

64. Consonants are the result of audible friction or stopping of the breath in some part of the mouth or throat. The main distinction between vowels and consonants is that while in vowels the mouth-configuration merely modifies the vocalized breath—which is therefore an essential element of them—in consonants the narrowing or stopping of the mouth passage is the foundation of the sound, and the state of the glottis is something secondary. Consonants can therefore be breathed as well as voiced, the mouth-configuration alone being enough to produce a distinction without the help of voice. All consonants can be whispered.

65. The friction of an 'open' consonant depends on the width of the organic passage. Consonants whose friction is distinctly audible both with breath and voice, such as *s* and *z*, *f* and *v*, are called 'hisses' when breathed or whispered, 'buzzes' when voiced. Some consonants are formed with so wide a passage as to be almost vowels when voiced, and consequently almost inaudible when breathed. Such 'vowel-like' consonants are *l*, the weak English *r*, and the nasals *n*, *m*, whose want of friction is due to the unimpeded flow of the breath through the nose. Breath 'stop' consonants, such as *t*, have no sound whatever in themselves, and are only rendered audible by the puff of breath or explosion that accompanies them (124). Voice stops, such as *d*, are practically vowels in themselves, and their consonantal character is only shown at the beginning or end of the stop. *l* and the nasals betray their consonantal character in the same way: when they are final, the consonantal flap is distinctly audible, as in *tell*, *ten*. Breath in consonants is left unsymbolized, voice being indicated by the incorporation of the voice-stroke, thus ʊ=*t*, ϖ=*d*, ω=voiceless, ω=voice *l*. Whisper is shown by the whisper-modifier; as in ω›=whispered *l*.

66. The distinction of narrow and wide applies to consonants as well as vowels, though in consonants it is less noticeable, and can generally be ignored. It is symbolized by the addition of the modifiers ˄ for narrow, ˅ for open consonants (43). If we consonantize ɿ and ɿ by narrowing the mouth-opening till a buzz is produced we shall find that the resulting ɜ˄ and ɜ˅ are still quite distinct, the latter being the English *w*, the former the French sound in *oui*. So also narrow *s* may be heard in energetic hissing, wide *sh* in gentle hushing—sɩ˄, ƨɩ˅. Consonants seem to be generally wide in English, narrow in French.

67. Consonants admit of a twofold division, (1) according to *form*, (2) according to *place*.

68. The foundation of the consonant-symbols is a segment — c — of the open-throat symbol o. This fundamental symbol is modified to express the different forms of consonants—thus ɑ = the 'stop' *k*—and is turned in different directions to show the place of the consonant—ɑ = the 'back' *k*, ʊ = the 'point' *t*, etc.

FORM.

69. By form there are five classes of consonants:

(*a*) **Open** consonants are those in which the passage is simply narrowed without any contact. They are expressed by the unmodified consonant-symbol or some modification of it, sometimes by the 'open-modifier' ‖: c = *ch* in German and Scotch *loch*, > = *f*, s = *s*. The restriction as to contact applies only to the actual friction channel, and even then there may be slight contact, provided the current of breath is not impeded. Thus, in forming c the uvula often touches the back of the tongue, but without modifying the sound perceptibly, and even in s the tongue often comes in contact with the ridges of the gums without influencing the sound. In such a consonant as >, on the other hand, the contact of the lips and teeth has the effect of forcing the breath to seek a channel elsewhere, namely through the interstices of the teeth, which form the real friction-channel. It is, however, also possible to form an *f* between the lips and the teeth without any contact.

(*b*) **Side** (or divided) consonants are formed by stopping the middle of the passage, leaving it open at the sides—often only on one side, giving a 'unilateral' consonant.

The commonest type of this class is the 'point-side-voice' consonant ɷ *l*. These consonants are expressed by indenting the consonant-symbol, sometimes by the 'side-modifier' ʜ. The 'unilateral modifier' is ᵘ.

(*c*) **Stopped** (or shut) consonants are formed by complete closure, as in ɑ *k*, ʊ *t*. They are expressed by a bar across the consonant-symbol, or by the addition of the 'stop-modifier' ı.

(*d*) **Nasal** consonants are formed by complete closure of the mouth-passage while the nose-passage is left open. If we take any stop, such as ϖ *d*, and allow the air to pass through the nose by lowering the soft palate, we obtain the corresponding nasal, in this case ɜ *n*. The symbols of the nasals are formed from those of the corresponding stops by joining on the nasal modifier to the bar, and omitting the consonant-segment.

When an unstopped (open or divided) consonant is formed with the nose-passage open, it is said to be 'nasalized,' which is denoted by the addition of the nasal modifier ʃ; thus ɷʃ is a nasalized *l*.

(*e*) **Trills** (or rolled consonants) are a special variety of unstopped consonants—generally of open consonants. They result from the vibration of the flexible parts of the mouth, either against one another, as when the lips are trilled, or against some firm surface, as when the point of the tongue trills against the gums in forming the strong Scotch *r*, and the uvula against the back of the tongue in the Northumbrian burred *r*. Their common character is due to the rapid periodic interruption of the breath by the contact of the trilling body with that against which it is trilled, its elasticity—or, in the case of the uvula, its weight—causing it to resume its former non-contact, to be again driven or to fall back. Trills are therefore intermediate between open and stopped consonants. Trilling is indicated by the 'trill modifier' ʂ, thus ωʂ = Scotch *r*.

70. All consonants may be pronounced with *tenseness* (ʌ) or *looseness* (v), according to the degree of approximation of the organs. Thus loose ɷʌ is practically equivalent to the vowel ʃ or ſ. Even stops may be pronounced loosely, so that, for instance, it may be difficult to distinguish between ϖ *d* and ψ *ð*. Tenseness and looseness are most nearly allied to the distinctions of height in the vowels, and must not be confounded with narrowness and wideness, which, in consonants as in vowels, depend on the shape of the tongue.

PLACE.

71. By place there are five main classes:

(*a*) **Back** (guttural), formed by the root of the tongue and the soft palate, expressed by turning the consonant-curve (representing the root of the tongue) backwards (35), the symbols of nasal consonants following the direction of the corresponding stop symbols. The 'back modifier' is (—a curtailed c. Examples are the back-stop ɑ as in *come*, the back-nasal-voice ɜ as in *king*.

(*b*) **Front** (palatal), formed by the middle part of the tongue and the hard palate, and symbolized by turning the consonant-symbol so as to be pictorial of the arched tongue, as in the front-open-voice ɷ in *you*. The 'front modifier' is ˋ.

(*c*) **Point**, formed by the point of the tongue and the gums or teeth. This class is commonly called 'dental,' but the point of the tongue is not necessarily brought against the teeth. Point consonants are symbolized by turning the points of the consonant-segment upwards in the same way as the point of the tongue is directed upwards in such a consonant as the point-open-voice ω in *red*. The point-modifier is ˎ.

The point-teeth consonant in *think* is symbolized by sharpening ᴗ into ∨ so as to be pictorial of the teeth-edges.

There are two special modifications of point-consonants that require notice, **inversion** and **protrusion**. In inversion the point of the tongue is turned back—whence the 'inversion-modifier' (ᴄ)—towards the soft palate, so that the narrowing, dividing, or stopping is formed between the lower edge of the tongue-point (or blade) and the arch. ωᴄ is the West-of-England inverted *r*. In protrusion the point of the tongue is extended to the lips—whence the 'protrusion-modifier' (ɔ)—as in blowing a small object from the tip of the tongue :ƱɔƆ.

(*d*) **Blade**, formed by the blade of the tongue. The representative blade consonant is S = *s*, whose symbol is a combination of those of front-open and point-open—∩ and ᴗ, blade being a compromise between these two. The blade-modifier is ʃ. **Blade-point** is blade modified by raising the point of the tongue. It is symbolized by reversing the unmodified blade symbol, and its representative is the ƨ in *she*.

(*e*) **Lip** (labial) consonants are symbolized by turning the consonant-curve forwards, nasals following the direction of the corresponding stops, as in ᴅ *p*, ɼ *m*. The 'lip-modifier' or 'rounder' is).

Lip-teeth consonants, such as *f*, are symbolized analogously with the point-teeth consonants, by sharpening the curve of ɔ into >, which is the symbol of *f*.

72. Besides the simple positions, there are compound consonants formed by narrowing etc. the mouth-channel in various places at once. The most important are the front-modified and lip-modified consonants, formed respectively by raising the front of the tongue and narrowing the lip-opening simultaneously with some other action. These effects are symbolized by the addition of the proper modifiers. Thus ω\ is a combination of ω and ɷ (front-modified or palatalized *l*), ω) is a rounded *l*. c) and ɔ(—lip-modified back-open and back-modified lip-open, the back action predominating in the former, the lip action in the latter—are for convenience made into ͼ, as in German *auch*, and ͽ, as in *what*. The lip-back modifier is ͽ. Thus ωͽ = *l* + *w*. There are many other combinations, expressed either by modifiers or by + between the symbols of the two elements, as in ʃ˕ɑsɭɑ+ʊωʃ˕ *exactly*. ɑ+ʊ could also be expressed by ɑ\ǀ, where \ǀ = 'point-stop modifier.'

73. We have hitherto considered only the main 'cardinal' consonant-positions. Such a symbol as ɑ really includes an infinite variety of positions, defined more accurately by the inner and outer modifiers. The deep inner ɑ⊣⊣ is not an English sound. ɑ⊣ is the English sound before back vowels, as in *caw*, outer ɑ⊢ being the English sound before front vowels, as in *key*. The considerable difference between these varieties is clearly brought out by transposing the elements of the two words—ɑ⊣ʃɷ, ɑ⊢ɟ•. It will be found on trial that ɑ has a different position before each vowel, being less advanced before low front vowels, as in *can* ɑɩɜ, than before high front vowels, and so on.

74. The distinction between inner, medium, and outer is peculiarly important in the front consonants, where the medium position is represented by English ɷ in *you*. Outer front comes near the blade position, but is distinguished from it by absence of point-articulation, the point of the tongue being kept clear of the palate. It is still more difficult to distinguish between blade and the combination ɷ⊢\—outer front + point.

75. The medium point position is on the gums just behind the teeth, where English *t* and *d* are formed, in which, however, the tongue is generally flattened into the blade-shape. In English and most other languages point *r* tends to the inner position—ω⊣. Hence the blade-point ɛ in *she* is naturally more retracted than the unmodified blade-consonant s, but less so than ω. But even ω can be advanced almost to the teeth, although it ultimately merges in ʋ. If the point is brought back to the arch-rim it practically assumes the outer inverted position—ωc⊢. Outer point implies articulation against the teeth, or with the point half on the teeth, half on the gums. When the tongue is put between the teeth, the consonant is called 'interdental', which may be indicated by ⊦⊦.

76. We have hitherto seemed to take for granted that the tongue always articulates against the nearest part of the palate, that, for instance, in Ω⊣ the inner front of the tongue is brought against the inner front of the palate. But it is possible to produce a compromise between ɑ and Ω in quite a different way, namely by bringing the medium front of the tongue against the outer back of the palate. The neatest way of expressing this would be to denote the palate-positions by the addition of diacritical consonants; and it is probable that as our analysis becomes more minute, some such device will be adopted. Meanwhile we will content ourselves with expressing the palate-positions by ordinary consonant-symbols in parentheses. Thus the combination we have just been considering can be written Ω⊣⊦+(ɑ⊢) or more briefly Ω(ɑ⊢).

NON-ORAL CONSONANTS.

77. The throat-consonants—the glottal stop, and the various wheezes—have been described above (30, 31).

78. There is also a uvula-stop ʃı, but it occurs only in such combinations as *dn* in *bidden*. Here the mouth-stop is maintained from the beginning of the *d* to the end of the *n*, the sole change from the *d* to the *n* being the opening of the nose-passage required to form a nasal consonant. As this action is necessarily implied by writing ϖɜ together, it is superfluous to indicate it further. If we devocalize the *n* of such a word as *eaten*, making it into ſɷʊʒ with a strongly snorted ʒ, we can hear and feel the uvula-explosion distinctly. The action ʊʒ is a not uncommon and very disagreeable form of sniffing.

TABLE OF CONSONANTS AND GENERAL REMARKS.

79. The chief consonants are shown in the annexed table, with keywords.

80. In naming the consonants place comes first, then form, and breath etc. last. In the stops and hisses 'breath' may be omitted. Thus ɑ *k* back-stop, ≥ *v* lip-teeth-open-voice, ωʃ *r* point-trill-voice.

81. The consonants are generally easier to recognise by ear than the vowels, the chief acoustic difficulties lying in the various transitions between them and the adjacent sounds, which will be treated of under Synthesis.

82. But their articulation often offers great difficulties, especially in the case of the trills, which require long practice.

ACOUSTIC QUALITIES OF CONSONANTS.

83. The following table shows the order of the pitches of the chief open consonants, beginning with the lowest:

ɔ ɑ c ɔ > ʊ ∪ ƨ s ∩.

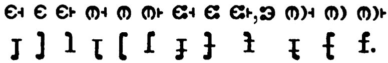
84. Observe the close analogy with the vowel-pitches, the lowest-pitched consonant ɔ being a lip-narrowed unvoiced form of the lowest-pitched vowel ɨ, and ∩ cor-

	Throat	Back	Front	Point	P.-teeth	Blade	Bl.-point	Lip	L.-Back	L.-teeth
	VOICELESS.									
Open	0 ɹ*h* ح *Ar.* hha	ϲ x χ *G. ach*	∩ ç *G.* ich	ʊ r*h* *Icel.* hr	∪ þ *thin*	Ѕ s	ƨ ʃ fish	ɔ ɸ	ɷ ʍ *what*	> f
Side	...	ɛ ɭ*h*	ɷ λ*h*	ω l*h*	ω⊦			ɜ		
Stop	ᵡ *Glot. stop*	ɑ k	Ω c *Hung.* ty	ʊ ƭ	ʊ⊦ *F.* t	ʊɩ, Sı	ƨı	ɒ p		
Nasal	...	ɹ ŋ*h*	ɩ ñ*h*	ɿ n*h* *Icel.* hn	ɿ⊦			ɼ m*h*		
	VOICED.									
Open	θ ɹ *Ar.* ain	є ɣ *G.* sagen	⋒ j *you*	ɷ r	ψ ð *then*	Ѕ z	ƨ ʒ *rouge*	ɘ β *South G.* w	ɷ w	≯ v
Side	...	8 ɭ *Russ.* pal*k*a	ɷ λ *Ital.* gl.	ɷ l	ω⊦			ɜ		
Stop	...	ɘ g	Ω ɟ *Hung.* gy	ϖ d	ϖ⊦	ϖɩ, Sı	ƨı	ɒ b		
Nasal	...	ɹ ŋ *sing*	ɩ ñ *Ital.* gn	ɿ n	ɿ⊦			ɼ m		

responding to ſ. Within each consonant there are lesser gradations of pitch from inner to outer, thus O˧, O˫˧, O˫; which, again, agrees with the relations of consonants to vowels, O˫ being the exact consonantal equivalent of ſ (86).

RELATIONS OF CONSONANTS TO VOWELS.

85. The various positions of the open voiced consonants must necessarily yield more or less distinct vowel-sounds when expanded enough to remove audible friction. The relations between the consonant and vowel positions are very important, and should be carefully studied. Thus, starting from buzzed medium Є˫˧ the student should carefully increase the distance between the back of the tongue and the soft palate till he obtains a pure vowel-sound—which will be] or]. The following are the more important of these relations:



86. In comparing ω˧, ω, ω˫ with ɪ, [, ſ etc., we see that the retraction of the tongue-narrowing from ω˫ to ω˧ corresponds exactly to a similar progression in the vowels (36). It would, indeed, be possible to substitute some such symbolization as ſ˫ ſ ſ˧ for ſ [ɪ; but this would be practically inconvenient, and would ignore the distinctive peculiarity of vowels as opposed to consonants, namely their power of indefinitely expanding the voice-channel from which results the distinctions of height.

87. The point-consonant ω may be weakened into a vowel, the result being practically a low-mixed point-modified vowel—I\.

88. ɯ, ɜ, and ɛ may be weakened in the same way, with similar results.

Sounds Formed without Expiration.

89. All the sounds hitherto described imply out-breathing or *expiration* (>). It is also possible to form sounds with in-breathing or *inspiration* (<). It is a common habit of speech to pronounce such words as *no* in this way, to express emphatic denial. ɔ<v is the natural symbol of drinking, and ɔ<ʌ is an ejaculation of pain.

90. Some sounds are produced without either out- or in-breathing, but solely with the air in the throat or mouth. The 'implosives' (130) are formed in the former, the suction-stops or 'clicks' in the latter way. In the clicks the tongue or lips are placed in the position for a stop, and the air is sucked out from between the stop-forming organs; they are thus pressed strongly together by the air in the mouth, so that their separation produces a sharp smacking sound. This action is regarded as a kind of stopped inspiration and is accordingly expressed by adding a stop to the in-breather. Thus D◂ is an ordinary kiss, Ʊ◂ is the expression of impatience written *tut!* In many savage languages these clicks are essential elements of speech.

SYNTHESIS.

91. We have hitherto considered sounds from a purely analytical point of view, that is, each sound has been considered by itself, as if it were a fixed, isolated element. But in language sounds are combined together to form sentences, and many sounds occur only in certain fixed combinations. Hence the necessity of synthesis as well as analysis. Analysis regards each sound as a fixed, stationary point, synthesis as a momentary point in a stream of incessant change. Synthesis looks mainly at the beginning and end of each sound, as the point where it is linked on to other sounds; while analysis concerns itself only with the middle of the fully developed sound. Synthesis is thus the science of *sound-joints* or 'glides.' There is also a more general kind of synthesis which deals with the *relations* of sounds to one another in sound-groups—their difference in length, loudness, pitch, etc. Synthesis, lastly, deals with the organic and acoustic *grouping* of sounds into syllables, etc., and the divisions between these groups.

92. The popular fourfold division of the elements of speech into letters (that is, sounds), syllables, words, and sentences, is not purely phonetic, but also partly graphic and logical. The first and most important point to see is that our ordinary word-division is a *logical* ~~and not a~~ *phonetic* ~~analysis~~. No amount of study of the sounds only of a sentence will enable us to recognize the individual words of which it consists. We may write down every sound, every shade of synthesis, but we shall never be able to analyse the sentence into separate words till we know its meaning, and even then we shall find that word-division postulates much thought and comparison of sentences one with another.

93. The only division actually made in language is that into 'breath-groups.' We are unable to utter more than a certain number of sounds in succession without renewing the stock of air in the lungs. These breath-groups correspond partially to the logical division into sentences: every sentence is necessarily a breath-group, but every breath-group need not be a complete sentence.

94. Within each breath-group there is no pause whatever, notwithstanding the popular idea that we make a pause between every word. Thus, in such a sentence as *put on your hat* we hear clearly the 'recoil' or final breath-glide which follows the final *t* of *hat*, but the *t* of *put* runs on to the following vowel without any recoil, exactly as in the single word *putting*. In *put back* there is no glide at all after the *t* (143).

95. The only phonetic divisions in a breath-group are those into sounds and syllables and intervening glides.

96. The most important general factors of synthesis are *quantity* and *stress*, which both modify glides and constitute relations between adjoining sounds.

Quantity.

97. We may distinguish five degrees of quantity or length:

very long	ɿ⧫⧫
long	ɿ⧫
half long or medium	ɿ•
short	ɿ▾
very short	ɿ▾▾

but for practical purposes the threefold distinction of long, half long and short is generally enough. Often, indeed, it is not advisable to do more than denote the distinction of long and short, assigning ⧫ to long, and leaving short unmarked.

98. Full length may be heard in English stressed vowels when final, as in *sea*, and before voiced consonants, as in *seize*, half-length in stressed vowels before breath consonants, as in *cease*. Short final stressed vowels, as in French *si*, are difficult to English speakers.

99. The distinctions of quantity apply to consonants as well as vowels. In English consonants are long after a stressed short vowel, as in *hill*, short after a stressed long vowel, as in *heel*. But in such cases the length is often distributed equally over vowel and consonant. It may also be observed that length in the case of a breath stop like *t* means length of pause or cessation of sound. Short consonants after short stressed vowels offer great difficulties to English speakers; they may be heard in German words such as *mann*.

100. We can also distinguish degrees of *rapidity* of speech in different breath-groups or longer periods.

Such differences of 'tempo' may be indicated by prefixing the quantity-marks + the symbol of breath: O⧫ :ɑ]ꜰ ·]ɒ=*come up* uttered slowly.

Force (Stress).

101. Force, like quantity, belongs essentially to synthesis, for it is always relative, always implying comparison either of two different groups of sounds or of two different portions of the same group. Physically it is synonymous with the effort by which the breath is expelled from the lungs. Every impulse of force is therefore attended by a distinct muscular sensation. Acoustically it produces the effect known as 'loudness,' which is dependent on the size of the vibration waves which produce the sensation of sound. When we say, therefore, that one sound, or group of sounds, is uttered with more force than another, as in the first syllable of *heavy* compared with the second, we mean that in its utterance the air is expelled from the lungs with a greater muscular effort, and that in consequence the resulting sound-waves are larger, which produces an effect of greater loudness on the ear.

102. Force in its synthetic sense must be carefully distinguished from those gradations in the friction of unstopped consonants which are due to the varying width of the configurative passage (70), although, of course, all articulation postulates a certain amount of force to be audible at all.

103. We have now to consider the changes of force in a single breath-impulse, as in pronouncing any long vowel, such as ʃɨ. Here we have three degrees of force,

level	ʃɨ=
increasing ~~(crescendo)~~	ʃɨ<
diminishing (diminuendo)	ʃɨ>.

104. In examining the force of any sound-group it is a great help to whisper it, which gets rid of any disturbing changes of pitch.

105. The general tendency of language is to pronounce with diminishing force. Thus in English the *c* of *cat* is pronounced with more force than the *t*. Hence also the end of a long is weaker than that of a short vowel, the force diminishing continuously throughout the long vowel. Thus the *t* of *cart* is weaker than that of *cat*. In German the diminution of force is still more rapid than in English. In French, on the other hand, the force is nearly equal, the final *t* of *toute* ʊ+ɩʊ+, for instance, being pronounced with as much, or nearly as much force as the initial one. Increasing force may be heard in interjections, such as ʃɨ< denoting joyful surprise. Here it is accompanied with a marked rise in pitch, but if it is whispered, the < is unmistakeable.

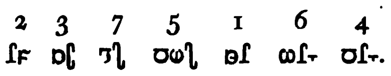
106. The influence of force on the synthesis of speech is very important, for the sense of unity and separation depends mainly on it. *Continuity* of force gives a sense of *unity*, as in ʃɨ<, ʃɨ>, ʃɨ<>, *discontinuity*, as in ʃɨ<<, ʃɨ>>, that of separation, the ʃɨ being broken up into two syllables, even when there is not the slightest pause.

107. The comparative force with which the syllables that make up a longer group are uttered is called 'stress.' In speaking of the stress of words in a sentence as opposed to that of syllables in a word the term 'emphasis' is commonly used, but this distinction is not admitted in phonetics, which ignores word-division (92), and divides sentences straight off into syllables.

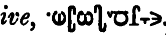
s-lle n

108. There are three main degrees of stress: *strong* (·), *half-strong* or 'medium' (:), and *weak* (˅). *Very strong* or 'extra strong' may be marked (;). (·) is assumed to be an abbreviation of (^), which is a modification of ʌ (70). Weak stress is generally left unmarked. (˅) may then be utilized to indicate a weak stress slightly stronger than another weak one. In connected texts where it is necessary to mark unstressed words, weak stress is denoted by (-). All stress-marks are put before the element on which the stress begins, so as to leave room for quantity-marks and other diacritics after it. Another advantage of this method is, that it marks the divisions into syllables (156). All three degrees of stress are shown in such a word as *contradict* :ɑɟƷʊɷʅ·ϖʃɑʊ. The sentence *come at once!* has exactly the same stress: :ɑ]ꟻʅʊ·ɜ]ƷS or :ɑ]ꟻ -ʅʊ ·ɜ]ƷS.

109. The degrees of stress are really infinite, and in a single sound-group (word or sentence) every syllable may have a different degree of stress. Thus such a word as *impenetrability* has, roughly speaking, two stresses, a strong one on the fifth, and a medium one on the first (or sometimes on the second)—:ʃꟻɒ[Ʒʅʊɷʅ·ɘʃɷʃ˖ʊʃ˖. But if we pronounce *-bility* by itself, we shall find that all three syllables have a different stress, the third being stronger than the second and weaker than the first. In *penetra-* there is the same relation, but all the syllables are a shade weaker than the corresponding ones in *-bility*. The order of the syllables in stress is therefore as follows, 1 being the highest:



110. The surest way of determining the relative force of any two syllables is to pronounce the other syllables *mentally* only, or in a whisper, pronouncing the special syllables aloud, and their relative force will then come out clearly. Thus, taking *-bility* by itself, if we utter the first syllable mentally, the other two aloud, we shall find that the second of these two has the stronger stress.

111. There is an important feature of stress generally which in most cases makes any minuter symbolization of stress unnecessary. This is its rhythmic character, or the tendency to alternate weak and strong stress. Perfect uniformity of stress is as phonetically unnatural as level force in a single syllable, but the tendency of stress is not, like that of a single force-impulse, to decrease progressively, but rather to sway to and fro. Hence in a group of three syllables, of which the first has the predominant stress, we may generally infer that the second will be weaker than the third, as in *relative*, . Of course, in very rapid speech these minute distinctions become unrecognisable, the two last syllables of such a word as *relative* being apparently uttered with a single, progressively diminishing force-impulse.

112. But stress in all languages is more or less governed by logical as well as phonetic laws, which, of course, often clash. *Level* stress is, accordingly, very common in English, as in *thirteen* when uttered by itself, while in *thirteen years* the stress on the second syllable is diminished: ·ᴗɪ·ʊſɷɜ, ·ᴗɪ:ʊſɷɜ ·ɷſ·ʅs. In French there is a general tendency to level stress, the strong syllables rising only a little above the general level.

The discrimination of degrees of stress is no easy matter in any case, because of the counter-associations of quantity, intonation, and vowel-quality, which make us apt to fancy that long, high-toned, or clear-vowelled syllables have stronger stress than they really have. A long weak-stressed vowel may be heard in the drawling pronunciation of *what a pity!* :ɔɟʊ -ʅ ·ɒſʊſ⊣. A stressless clear vowel may be heard in such a word as *insect* ·ſɜsʃɑʊ compared with *edict* ·ſɷʊſ-ɑʊ, whose second vowel is one that occurs only in unstressed syllables.

113. Difference of force in whole groups of sounds may be indicated analogously with differences of speed (100), thus ·o :ɑ]ꜰ ·]ɒ denotes *come up!* uttered forcibly.

Glides.

114. Synthesis introduces us to a special class of elements called 'glides' or transitional sounds, produced during the transition from one sound to another. Thus in such a group as ɑſ⊦ (or English *key*) we have not only the two sounds ɑ and ſ, but also the sound produced in passing from the back position of ɑ to the high-front one of ſ. This glide differs from the two extremes, ɑ and ſ, in having no fixed configuration: it is, in fact, composed of all the intermediate positions between ɑ and ſ, through which it passes without dwelling on any of them.

115. It would clearly be impossible to symbolize all the infinitesimal intermediate positions of which a glide is made up; nor is it ever necessary, the general principle being that in all cases of transition from one position to another the shortest way is taken: given, therefore, the symbols of the fixed positions, the direction of the glide follows as a matter of course. These 'essential' glides are implied simply by the juxtaposition of the symbols of the fixed positions between which they lie, as in ɑſ. Vowel-glides are expressed in the same way as an 'unsyllabic' vowel (153), namely by writing the vowel symbol consonant size, thus ɾ = glide-ſ. Consonant-glides are expressed by adding), thus ɷ) = glide ɷ.

116. Glides are distinguished according as they precede or follow a sound as 'on-glides' and 'off-glides.' Thus in Jɑſ (or English *echo*) the on-glide of ~~ɑ is that~~ from the J, and the off-glide of ɑ is that which joins it to ſ. Initial glides, such as the on-glide of the ɑ in ɑſ, being only preceded by a silence, are generally inaudible. Final, or 'on-silence' glides, such as the off-glide of ɑ in ſɑ (or English *kick*) are generally audible.

117. Although the *direction* of a glide is implied by the position of the two fixed points between which it lies, its *character* may be varied.

118. The acoustic effect of glides varies according to the force and rapidity with which they are uttered. If in such a group as]ɷ] the transition from the] to the ɷ is made rapidly and with slight force the glide is not noticed at all, although any break, however slight, would be at once heard. But if the transition is made slowly and with only a gradual diminution of force, we hear the glide from the] up to the front position of the ɷ as the second element of a diphthong, giving the effect of (aija). In such combinations as ω], as in Spanish *llano*, it is often difficult to know whether to write the glide or not, whether to write ω]ℸ} or ωɾ]ℸ} (ωɷ)]ℸ}). The former is however the correct notation.

VOWEL-GLIDES.

119. Vowels may be begun and finished in various ways:

(*a*) The glottis is gradually narrowed, passing through the various positions from breath and whisper till voice is produced. This gives the 'gradual' beginning •]⍿, which is the usual one in English, and in most other languages.

(*b*) The breath is kept back till the glottis is closed for voice, which begins at once without any introductory breath. This is the 'clear' beginning ˈ]⍿, well known to singers, who are taught to avoid the 'breathy' •]⍿. It is the usual way of beginning a vowel in German.

120. In both these cases the stress begins on the vowel. If it is thrown on to the preceding glides, they are at once recognized as independent elements, •]⍿ (aa) becoming °]⍿ (haa) with the 'aspirate,' while ˈ]⍿ becomes xȷ̇ with the glottal stop (30). ◦ is generally modified by the following vowel, whose mouth-configuration it partly anticipates. It is then partly a weak throat-consonant, partly the voiceless glide-vowel corresponding to the vowel which follows, and is then placed on a shortened vowel-stem, being written ɩ. ɩɪ, ɩɨ are thus almost equivalent to ɾːɪ, ɨːɨ or ɷɪ, ɔɷɨ.

121. Vowels are finished analogously:

(*a*) By a gradual opening of the glottis, the final glide passing through whisper to breath, giving the 'gradual' ending ȷ˙.

(*b*) By a cessation of expiration while the glottis is still closed for voice, giving the clear ending ȷ˖, which is the usual ending in English.

122. If uttered with stress these endings become respectively ȷ◦ or ȷɩ, which is still the Sanskrit visarga, as in *manaḥ*, and ȷx, the Danish 'stöd-tone' (30). If a high vowel-position is relaxed slowly before ◦ or ɩ, the off-glide has a strongly consonantal character, even if there is very little stress, giving ɪɷ, ɨɔɷ etc., which is frequent in the Scandinavian languages.

CONSONANT-GLIDES.

123. Stops: Off-glides. All consonants consist acoustically of three elements, the consonant itself, and its on- and off-glide. Each of these three elements may be breathed or voiced, and modified in other ways as well.

124. The glides of stops are peculiarly important. Voiceless stops, indeed, are acoustically speaking pure glide-sounds, only audible at the moment of transition from or to some other sound. Voiced stops, on the other hand, can have a distinct sound of their own in addition to that of their glides, but as they can only be voiced by driving voiced breath into an air-tight chamber—forming the celebrated 'blählaut' of the German phoneticians—they cannot be maintained for any length of time.

125. Confining our attention for the present to the off-glides, we may distinguish four chief kinds of breath—or rather voiceless—and voice stops: (*a*) voiceless stop and breath glide ɑ•], as in *come*; (*b*) voiceless stop and voice glide ɑ'], nearly as in *go* when no vowel precedes; (*c*) voice stop and breath glide ɘ•, as in *egg*; and (*d*) voice stop and voice glide ɘ', as in *eager*.

126. The following table gives all the combinations—initial, medial, and final—those that occur in English being marked *:

Initial.	Medial.	Final.
*ɑ•]	*]ɑ•]	*]ɑ•
*ɑ']	]ɑ']	]ɑ'
ɘ•]	]ɘ•]	*]ɘ•
ɘ']	*]ɘ']	]ɘ'.

(*a*) In ɑ•] the glottis is left open while the stop is being formed, and the chords are not brought into the voice-position till the moment of loosening the stop, so that before the glottis has time to form voice there is a slight escape of breath between the stop and the vowel—the glide from the stop to the vowel, or from the stop to silence, is breathed. In English the puff of breath varies in force according to emphasis etc., and is always weaker medially than initially or finally, as may be seen by comparing the second ɑ in *cooking* with the two ɑs in *cook*, where, again, the initial ɑ has the stronger glide of the two, because of the progressive diminution of stress (105), whence also the force of the breath glide is still more diminished after a long vowel, as in *eating*.

(*b*) ɑ' seems to be formed in two ways. In initial English *go* at the beginning of a sentence the glottis is in the position for voice during the stop, but no air is driven in, and so the stop is inaudible as in *k*, but voice begins the moment the stop is loosened, and the off-glide is therefore voiced. In this kind of stop the voice is apt to break out a little before the end of the stop or at any rate to whisper part of the stop—ɑɒ'ȷ. Pure ɑ' is formed by sounding voice simultaneously with the loosening of the stop, so as to prevent any escape of breath. The French and South-German (South European generally) *k*, *t*, *p* are formed in this way, which makes them sound like *g*, *d*, *b* to an unaccustomed ear.

These sounds offer great difficulties to English speakers, who, however, will find initial *g* in *go* a convenient stepping-stone. But they must be practised carefully, for the breathy stops in English *come*, etc. are very offensive to a South European ear. The student must not be satisfied till he can explode a vowel loudly from the ɑ, ʊ or ɒ position without the slightest escape of breath or voicing or whispering of the stop.

(*c*) ȷɘ·ȷ, and thence ɘ·ȷ, may be easily obtained from the familiar ȷɘ· by joining on a ȷ.

(*d*) ɘ'ʅ is obtained by pronouncing the familiar ʅɘ'ʅ, dwelling on the consonant, and then dropping the initial ʅ. These 'full' initial voice-stops, which are common in the South European languages, suggest the corresponding nasals to an unaccustomed ear when sounded very fully. Final ɘ' may be obtained by shortening such a word as *bigger*. The French final *g*, as in ɞʅ‡ɘ' *bague*, often has this sound.

127. Stops: On-glides. The on-glide after a vowel is generally voiced: ʅ'ɑ•, ʅ'ɘ•. Breath on-glides before voiceless stops occur in Icelandic and occasionally in Scotch, as in ɔʄ•℧• *what*.

128. Stops: Stress-glides (Aspirates). All stops, especially when voiceless, postulate a certain compression of the breath behind the stop, so as to produce an audible explosion when the stop is loosened. On the force of this compression, which is due to the action of the lungs, the force of the glide and consequently the audibility of the stop mainly depend. The English *k*, etc. are generally uttered with but little force, but in the ordinary German *k*, as in ɑ•ʌʅℸ *kann*, there is a strong puff of breath.

129. But even in German the force of the breath-glide is something secondary, due only to the compression with which the stop is formed. If, however, the initial force is maintained during the formation of the glide itself, the glide is heard as an independent element —ɑ°ʅ. In this way the Irish-English, Danish and Sanskrit aspirates are formed, as in Irish *tell*, Danish *tale* ℧°ʅ‡ɷʅ. These sounds have nothing harsh about them, their characteristic feature being the distinctness of their glide, which has something of the character of the preceding consonant, so that ɑ°ʃ, for instance, sounds very like ɑcʃ, ʊ°ʃ like ʊʋʃ or ʊsʃ. The analogies with the different vowel-beginnings (119) are obvious.

130. Implosive Stops (Choke-stops). The implosion consists in closing the glottis simultaneously with the stop position, and then compressing the air between the glottis stoppage and the mouth one by raising the glottis like a plug by the action of its muscles. This action produces no sound while the stop is being held, but modifies the off-glide in a peculiar manner, giving it a ‘ choky ’ effect.

These sounds occur in Saxon German and Armenian. They are written ɑı, with the throat-stop modifier; the off-glide is voiced.

131. Unstopped Consonants. With unstopped consonants there is no difficulty in voicing the stop itself, and there are many consonants that are only occasionally unvoiced, such as the nasals. The glides of these consonants are always voiced as well.

132. In the breath unstopped consonants, both the consonant itself and the off-glide are breathed as in the corresponding stops: s·ʃ, ʃs·ʃ, ʃs·. But the breath-glide of the unstopped consonants is always weaker than that of the stops, because the explosive effect of the latter is wanting.

133. Hence also the aspirates of these consonants are weaker and less marked than those of the stops. But they may be distinctly heard in Irish-English in such words as *sir*.

134. The voiced buzzes admit of more variety than the voiced stops, because in them the different stages of glottis-narrowing that may precede voice are distinctly audible, whereas in the voiced stop there is hardly anything between full vocality and absolute silence.

135. In medial *z* (]s]) there can be no doubt of the vocality of the consonant, but initial and final *z* admit of various degrees of vocality.

(*a*) The glottis does not begin to put itself in the position for voice till the **s**-position is assumed, and consequently all the intermediate stages between full breath and full voice are heard in succession while the **s**-position is being maintained. This is the 'gradual' initial *z* in English *zeal*, etc.—**s:]**.

(*b*) The *z* is fully vocal throughout—that is, the glottis is closed for voice simultaneously with the beginning of the *z*. This is the 'clear' initial *z* of French, Russian, etc.—**s;]**.

It will be observed that these varieties of initial buzzes are exactly analogous to the two ways of beginning vowels (119).

(*c*) The glottis is open during the formation of the consonant, and is only brought together at the moment when the off-glide begins. This is the 'half-voice' *z* (**s'**), corresponding to initial **ɑ'**, and seems to be the usual German initial *s* in *so*, etc. As it is not easy to make the beginning of the voice correspond exactly with the beginning of the glide, this last variety is often modified into a compromise between (*a*) and (*b*), formed by beginning to narrow the glottis during the end of the consonant itself, so that the transition from breath to voice is completed just *before* beginning the glide.

136. Final *z* may also be fully vocalized throughout, or else gradually devocalized, passing from voice to whisper while the consonant position is still being maintained—]s꞉•,]sɒ•. Both may be heard in English *is*, etc., the latter 'gradual' ending being the most usual. The 'clear' ending with voiced off-glide—]s꞉'—is the usual one in French.

137. A final buzz preceded by a buzz or voiced stop is completely whispered in English, as in *thieves*, *rage* ᴗ[ɷ>sɒ, ω[ɾ+ϖƨɒ.

138. In this last case the glottis is not fully opened till the consonant is finished, which therefore consists of voice passing into whisper, followed by a breath off-glide. If the transition from voice to breath is completed during the beginning of the consonant itself, we have the 'half-breath' final *z*—]s꞉.

139. The vowel-like consonants when final occasionally end in a breath-glide. Thus in French *fille*=>[ɷ꞉, in Icelandic *vel*=>[+ω꞉.

140. Whisper-glides. In the case of stops whisper is inaudible in the stop itself, and is only heard in the glide. In most cases a whisper-glide is a transition to or from voice, and has the effect of a weak breath-glide, from which it can generally hardly be distinguished.

Final ɉɑ›, however, is easily distinguishable from ɉɑ•. It is heard in Icelandic *egg*.

141. **Modified Glides.** We have hitherto considered consonant-glides as modified mainly by voice, breath, and force. But they are capable of various oral modifications as well, of which rounding is the most important. Rounded glides are heard in such Russian words as *votŭ* »ɟʊ·, *komnata* ·ɑɟꟻꞁɉʊɉ where the inner rounding affects the consonant as well as the glide. ɑɟ sounds intermediate between (ko) and (kwo). In English *cool* the off-glide is only slightly rounded by the following vowel.

GLIDELESS COMBINATIONS.

142. In speech the general principle is to take the shortest way between two sounds in immediate juxtaposition. This often results in combinations which are effected without any glide at all. This is regularly the case in sequences of consonants having the same place, and differing only in form. Thus in passing from (n) to (d) or *vice versa* in ꞁʊ, ʊꞁ all that is done is to close or open the nose-passage, the absence of glide being as much implied by the juxtaposition of the two symbols as in the case of the uvular stop (78). Similarly in ɷʊ, ʊɷ the transition is made by simply closing and opening the side apertures, the tip of the tongue retaining its position. Combinations in which a stop is followed by an open consonant formed in the same, or nearly the same place, are effected either with no glide at all, as in ɒɔ, or a very slight one, as in ɒ>. In such combinations

as the latter one the glide is generally got rid of by assimilating the place of the first consonant to that of the second. Thus German *pf* in *pfund* and English *m* in *nymph* are both lip-teeth instead of the pure lip consonants ɒ, ꜰ, these words being pronounced ɔıɔꞁɴɒ, ɴſɔıɔ. Such changes may almost be considered as implied by the juxtapositions ɒɔ, ꜰɔ.

143. Even when two consecutive consonants are formed in different parts of the mouth, it is possible to form them without any glide, although in such cases gliding combination must be regarded as normal. Absence of glide is marked by (.). Thus English *act* is ɪɑ.ʊ, the tip of the tongue being brought into position before the ɑ-contact is loosened, while in French *active* there is a slight breath glide—ʝɪɑ·ʊſɔ.

144. Combinations of stops and vowellike consonants, such as *tr*, *dr*, *kl*, *kw*, are glideless in English, the breath-glide after a voiceless stop being carried into the vowel-like consonant, the first half of which it unvoices, as in *try* ʊʋ)ω)ɭɾ, *clock* ɑω)ω)ɟɑ. If the preceding stop is aspirated, its aspiration may be carried into the vowel-like consonant, so that the latter is completely unvoiced. Thus in Danish, where initial voiceless stops are aspirated, initial *kr*, *kl*, etc. become stop + breath *l* etc., as in ɑωɟɑ'ɭ *klokke*, ɑɴʃɪx *knæ*.

GLIDE-CONSONANTS.

145. Most consonants, as compared with vowels, have more or less the character of glides. Breath stops are acoustically pure glides (124). In such combinations as ʊƨ in *chill*, ʊs in German ʊsʅɾ˖ʊ *zeit*, the hiss is acoustically a mere modification of the breath-glide in *till*: we may almost say that the ƨ or s is the glide between the ʊ and the next vowel.

146. In slovenly speech, when a stop follows a vowel, the breath impulse is often so feeble that nothing is heard but part of the glide on to the consonant, the actual closure being formed without any breath at all: ɒſɑ) *big*. With nasals *man* becomes ɼʅɪʃ), only a nasal glide being audible. Other consonants are weakened in a similar way.

147. But there is a class of **Flap-consonants** which are pure glides, organically as well as acoustically, there being absolutely no fixed point in their formation. The East-Norwegian and Swedish 'thick *l*' is such a sound. It is an inverted *r* finished off with momentary contact of the tongue-tip against the inside of the arch-rim, the tongue moving forwards all the while from the moment of its being turned back to the single strong trill which finishes it. This sound can be roughly symbolized by ɷc\, as in Norwegian ˋ}ɨ)ˉɷc\ʃ *Olaf*.

Syllable Division.

148. Sounds differ much in *sonority*—the force with which they strike the sense of hearing. The most sonorous sounds are those formed with voice, and the less the voice is impeded, the more sonorous the sound. The two extremes are the opener vowels, such as ʃ, ɟ and the stops, the high vowels, such as ſ, being about on a level with the vowellike consonants, of which the nasals are the most sonorous. Of the voiceless consonants the high-pitched hisses are the most distinct.

149. The audibility of language depends then, roughly speaking, on its vowels. Acoustically consonants are mere modifiers of the vowels, and the ideal of distinctness would be reached by a language in which each consonant was separated from the next by a vowel.

150. Hence the ear learns to divide a breath-group into groups of vowels (or vowel-equivalents), each flanked by consonants (or consonant-equivalents—or, in other words, into syllable-formers or *syllabics*, and *non-syllabics*, each of these groups constituting a *syllable*. Syllabics are marked], non-syllabics), when necessary.

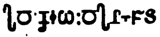
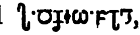
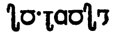
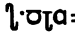
151. The relation between syllabic and non-syllabic is evidently a purely relative one. In such a group as *clay* the sonority of the vowel completely overpowers that of the *l* and makes it non-syllabic, but the *l* in *cattle* ɑɭʊω = ɑɭʊω] is so much more sonorous than the ʊ that the whole group is dissyllabic to the ear, as if the *l* were accompanied by a vowel. Even a voiceless hiss may be syllabic in such a combination as ɒsɪʊ or even ɒsʊ.

152. The same sound varies in audibility according to the length and force with which it is uttered. When two vowellike consonants come together, the one that has the greater length and force is regarded as the vowel. Thus ꜰ·Ʒɪ = ꜰ)Ʒ] suggests ꜰ]Ʒ, while ·ꜰƷ = ꜰ]Ʒ suggests]ꜰƷ or rather ·]ꜰ⌉Ʒ.

153. So also a vowel can lose its syllabicness in combination with another vowel, with which it then forms a *diphthong*. These diphthongic or glide vowels are written consonant size, being from a syllabic point of view consonantal vowels, as in *ai*, where the group is uttered with one impulse of diminishing force, and *ia*, which implies increasing force, the latter diphthong being equivalent to . Want of stress is more essential than gliding quality, for with the diphthongic vowel lengthened is still mainly diphthongal to the ear if the is kept stressless.

154. The unsyllabic element of a diphthong is generally a closer vowel than that which constitutes the syllabic element. The most perfect types of diphthongs are, therefore, *ai* and *au*, which are also the commonest. When clearly formed— , —the second elements are almost consonantal in character—suggesting *aj*, *aw* to an English ear—because English and most other languages content themselves with making the second element a mere approximation to the high position; thus in English the nearest equivalents of the above diphthongs are and , the second elements being still more obscured in Cockney pronunciation.

155. Such combinations as may be regarded as consonantal diphthongs (145).

156. The answer to the question, Where does the syllable begin? is, that if it has a distinct stress (strong or medium) its beginning corresponds with the beginning of the stress, as we see in comparing such pairs as  and ,  and =*at all times, a tall man; at Acton, attack.*

157. The difference between long and double consonants is a syllabic one. In ℨʊɫℨ the consonant positions are simply held with uniformly diminishing force till the ℨ is reached, when a new impulse may begin. In ℨʊʊℨ the consonant is held as long as in the preceding case, but the new force-impulse begins in the second half of the held consonant, which, of course, breaks the sense of continuity. This break is very distinct in such a group as *bookcase* ·ɒʇɑ:ɑʗɾ·s, because of the medium stress on the second syllable.

158. The distinction between ·ɑℨʊ·ƨɟɫʊ and ʅ·ʊƨʃɷ> *cŭt short* and *achieve*, ·ɟɫʊ·sʅʗɾ·ʊ *outside* and the German ɐʅ·ʊsʃɫꜰꜰ *geziemen* is exactly analogous.

159. The distinction between *close* and *open* stress is also syllabic. In the close stress of English and North German in such words as *better*, *vetter*, the ʊ is uttered with the same force-impulse as the preceding vowel—although this force-impulse has diminished by the time it reaches the ʊ (more so in German than in English, § 105)—any new impulse beginning on the following vowel: ·ɒʗʊʅ, ·>ʗʊʅϵ. In the open stress of South German, and the South European languages generally, the fresh impulse of force begins on the ʊ in such a word as *vetter*—·>ʗ·ʊʅɷɟ. Open stress—which is also heard in Welsh—sounds less abrupt than close stress, and to an unaccustomed ear suggests doubling of the consonant. The otherwise superfluous (ᐞ) may be used to indicate open stress, as in the South German ᐞ>ʗʊ·ʅɷɟ, Welsh ᐞɑ·ℨʊ·ʇ *cadw*.

160. When several syllables are uttered with one impulse of force, it is, of course, impossible to mark off the boundaries of the syllables by stress, and syllable-division becomes a subjective problem. It is, for instance, difficult to hear much syllable division in such a word as *necessary*, when uttered rapidly. Syllable-division is most clearly marked when it turns on stopped consonants, because of their greater force and abruptness. It is less clear when it turns on open consonants. Thus the difference between *an aim* and *a name*, between *alla* with long and with double *l* is not very marked.

Intonation.

161. Intonation, or variations of tone (pitch), depend on the rapidity of the sound-vibrations, which again depend on the length of the vocal chords (17).

Changes of tone may proceed either by *leaps* or by *glides*. In singing the voice generally dwells without change of pitch on each note, and leaps upwards or downwards to the next note as quickly as possible, so that although there is no break, the intermediate glide is not noticed. In speech the voice only occasionally dwells on one note, and is constantly moving upwards or downwards from one note to the other, so that the different notes are simply points between which the voice is constantly gliding. An absolutely level tone hardly ever occurs in speech, whose level tones are only relatively level, generally ending in a slight rise. There is often in speech a marked difference between a rapid rise or fall in which the ear is mainly impressed by the beginning and end of the voice-inflexion, and a slow glide which allows the intermediate tones to come out.

We may distinguish these as *voice-leaps* and *voice-glides*, remembering that the distinction is only a relative one, which cannot always be made with certainty. The difference between voice-leap and voice-glide is analogous to that between]ɷ] and]ɾɷ] (118).

162. There are three primary 'forms' or 'inflections' of intonation :

level -
rising / ⌜
falling \ ⌟ .

163. (′) and (‵) are, strictly speaking, symbols of voice-glides only, though in practice they are used to denote voice-leaps also, whose proper symbols are (⌜) and (⌟).

164. The level tone—or an approach to it—may be heard in *well* as an expression of musing or meditation ; the rising in questions or doubtful hesitating statements, as *are you ready ?* ; the falling in answers, commands, or dogmatic assertions, as in *yes, I am.*

165. Besides the simple tones there are compound ones, formed by uniting both in one syllable :

compound rising (ˇ)
compound falling (ˆ).

166. The compound rise may be heard in such a sentence as *take care !* when uttered warningly ; the compound fall in *oh !*, *oh really !* when implying sarcasm.

167. It is also possible to combine three tones in one inflection. Thus we can have (˜), which has the effect of (ˇ) being only more emphatic.

168. All these tones can be varied indefinitely according to the interval they pass through. As a general rule, the greater the interval, the more marked the character of the tone. For ordinary purposes it is enough to distinguish between a high rise (ʹ) and a low rise (ˏ), the former passing through a less interval than the latter. Conversely a high fall (ˋ) passes through a greater interval than a low fall(ˎ). A high rise may be heard in *what?* as an expression of mere enquiry (ʹɔɟʊ), a low rise in ˏɔɟʊ as an expression of surprise. In music semitones have a plaintive effect, and this is to some extent the case in speech also, where, however, plaintiveness is also expressed by modifications of the quality of the voice (177).

169. Besides the separate inflections of which it is made up, each sentence, or sentence-group, has a general pitch or key of its own. Key is marked by prefixing the voice-leap symbols in the same way as with the other group-modifiers, thus ⌜o :ɑ]ꜰ ·]ɒ = *come up!* in a high key. For ordinary purposes it is enough to distinguish three keys:

high	⌜
middle	⌜⌟
low	⌟,

the middle being generally left unmarked.

170. The high key is the natural expression of energetic and joyful emotions, the low of sadness and solemnity.

171. Change of key has also a purely logical significance. Thus questions are naturally uttered in a higher key than answers, and parenthetic clauses in a lower key than those which state the main facts. In all natural speech there is incessant change of key.

172. Changes of key may proceed either by leaps or progressively. Progressive change of key may be expressed by using (′) etc. as group-modifiers. Thus ′o is heard in all cases of passion rising to a climax.

Connection between Quantity, Force, and Pitch.

173. There is a natural connection between force, length, and high pitch, and conversely between weak force, shortness, and low pitch.

174. The connection between force and pitch is especially intimate. All energetic emotions naturally express themselves in high tones and forcible utterance, and increased vehemence of emotion is accompanied by a rise in force and pitch.

175. The association of force and quantity is less intimate. There is however a natural tendency to pass over the less important unaccented elements of speech, and to dwell on and lengthen the more prominent ones.

176. It is however a mistake to suppose that these natural tendencies represent necessities, and that high tone and strong stress can be regarded as convertible terms. Just as on the piano the lowest note in the bass can be struck with the same force as the highest one in the treble, so in language it often happens that strong stress is combined with low pitch. Still less can length be identified with stress.

Voice-Quality.

177. Besides the various modifications of stress, etc., the quality of the voice may be modified through whole sentences by various glottal, pharyngal and oral influences.

178. The influence of the lips is seen in the two qualities of the voice known as 'clear' and 'dull.' The clear quality is the result of opening the mouth widely and spreading out its corners. When exaggerated it gives a harsh, screaming character to the voice.

179. The dull quality of the voice is the result of slight separation of the jaws and neutral lip-position. English speech generally tends to the dull quality. When exaggerated it gives a 'muffled' character to the voice, which, when accompanied by low pitch, results in what is called the 'sepulchral' tone.

180. The dull quality of the voice naturally leads to nasality, for the breath, being impeded in its passage through the mouth, seeks another passage through the nose. Slight nasality is almost universal in English speech. Its presence is at once made manifest in singing.

181. Narrowing of the upper glottis gives a wheezy character to the voice, sometimes approaching to strangulation. This effect is familiarly known as 'the pig's whistle.' It may be heard from Scotchmen, and combined with high key gives the pronunciation of the Saxon Germans its peculiarly harsh character.

182. These modifications—which are the result of controllable organic positions—must be carefully distinguished from those which are due to peculiarities of the organs of speech themselves. Thus defects in the palate may cause permanent nasality (together with a peculiar hollowness of sound), an abnormally large tongue gutturality, etc. All these peculiarities are inseparable from the individual, while those first described may—and often do—characterise the speech of whole communities.

183. Voice-quality may be readily symbolized by prefixing modifiers:

OV|| = clear quality.
OΛ) = dull quality.
Oʃ = nasality.
ODΛ = wheeziness.
O(= gutturality.

Organic Basis.

184. Every language has certain general tendencies which control its organic movements and positions, constituting its organic basis or basis of articulation. A knowledge of the organic basis is a great help in acquiring the pronunciation of a language.

185. In English we flatten and lower the tongue, hollow the front of it, and draw it back from the teeth, keeping the lips as much as possible in a neutral position. The flattening of the tongue widens our vowels, its lowering makes the second elements of our diphthongs indistinct, front-hollowing gives a dull resonance which is particularly noticeable in our *l*, its retraction is unfavourable to the formation of teeth-sounds, and favours the development of mixed vowels, while the neutrality of the lips eliminates front-round vowels.

Our neutral tongue-position is the low-mixed or mid-mixed one of the vowels in *further* >ɪɫɯʅ.

186. In French everything is reversed. The tongue is arched and raised and advanced as much as possible, and the lips articulate with energy. French therefore favours narrowness both in vowels and consonants, its point-consonants tend to dentality, and, compared with the English ones, have a front-modified character, which is most noticeable in the *l*, while the rounded vowels are very distinct.

187. The German basis is a compromise between the English and French, standard North German approaching more to the French.

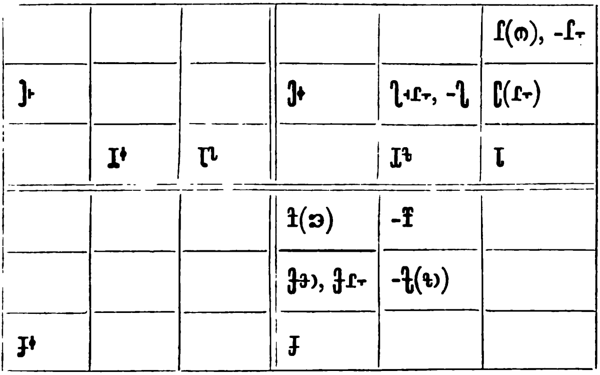
188. No language, however, carries out the tendencies of its basis with perfect consistency.

Thus in English we have the point-teeth ∪; and mixed vowels occur in French and German, etc.

ENGLISH SOUNDS.

Vowels.

189. The following is the English vowel-table, weak vowels (those which occur only unstressed) being marked by a preceding -, and the half-long quantity of the first elements of diphthongs not being marked.



190. The following list shows the correspondence of the Broad Romic symbols, with examples:

ɐ =] *as in* come.
aa =]ᶠ ,, father.

ai = ʅɾ *as in* high.
au = ɟɥ „ how.
æ = ɩ „ man.
e = ɾ „ men.
ei = ɾɾ „ say.
ə = ʅ „ t*o*geth*er*.
əə = ɪɬ „ bird.
eə = ɾʅ „ care.
i = ɾ, ɾ˕ „ fill, pit*y*.
ij = ɾɷ „ sea.
o = ɟ, ɬ „ not.
oi = ɟɾ „ boy.
ou = ɟɞ „ so.
ɔ = ɟɬ „ fall.
u = ɬ, ɬ „ full, value.
uw = ɬɜ „ too.

We will now consider the vowels more in detail, noting varieties of pronunciation.

191.]ŀ, mid-back-narrow. ɑ]ꜰ]ɒ *come up*. This vowel is slightly advanced. Full back] may be heard in the West of England pronunciation of *come* ɑ]˧ꜰ; to an unaccustomed ear it has the effect of a rounded vowel, resembling ɟ in *not*. In some Scotch dialects it seems to be lowered to ɟ—a sound which still more resembles ɟ. In the Cockney dialect this vowel is advanced, lowered, and widened, becoming apparently ɪ, as in ɜɪɬꞁ *one*. In Irish-English and American-English it is advanced and lowered to]ŀ˕ mid-back-narrow-forward-lowered, which approximates it in formation and sound to the ɪ in *err*.

192.]ɬ, mid-back-wide. >]ɬᴡʅ *father, farther*, ƨ]ɬ> *half*.

In the formation of this vowel the tongue gradually relaxes into the neutral mixed position, so that it might be written]ɩ. In Cockney English it is lowered to ɟ‡, which is often narrowed into ɟ‡, as in ɒ[ʊ‡sſ˔ ɒɟ‡ɑ *Battersea Park.*

193. l, mid-mixed-wide. ʊl·ɑ[ʋl *together.* It is difficult to define the formation of this vowel with precision, because it often degenerates into a mere voice-glide —ɪ—without fixed configuration, which is often whispered in protonic syllables. The most correct way of writing such a word as *together* in rapid speech would be, therefore, ʊɪ·ɑ[ʋɪ. The exact position of this vowel—as far as it is capable of being defined—is probably between mid and low: l˔.

The first element of the diphthong in *high* is retracted towards], into which it passes in Cockney English, where it is often lowered to ɟ: refined ϱl˧ſ˔, Cockney ϱ]ſ˔, ϱɟſ˔. Before *l* the glide is obscured to ı in Cockney English, so that ɾɟıω *mile* is hardly distinguishable from *marle.*

194. ɟ, low-mixed-wide. The first element of the diphthong in *how* ϱɟɩ, which in Cockney English becomes [—ϱ[ɩ, [ɩ. Scotch has]—ϱ]ɩ—and American-English]—ϱ]ɩ.

195. ɟ‡, low-mixed-narrow. ɟ‡ *err,* ɒɟ‡ω *bird.* In American-English this sound is raised towards], becoming]˔—the sound of American-English *come.* In some American pronunciations, especially that of New-York, ɟ‡ becomes lɪ, as in ɒlɪω.

196. ſ, high-front-wide. This is the sound of strong (stressed) *i* in *it* ſʊ, *fill* >ſω, the corresponding weak sound ſ˔ being intermediate between ſ and [: ɒſʊſ˔ *pity*. After ω preceded by a consonant ſ seems to be often retracted almost to the mixed position I, as in ɒωſ˧ʊſ˔ *pretty*. The long vowel corresponding to ſ is ſɷ or ſɾ˔, as in sſɷ *sea*, sſɷs *cease*; an ſ˔ modified by gradual raising of the tongue. In Cockney English the first half of this diphthong is lowered, so that sſ˔ɾ often sounds like s[ɾ˔ *say*. Before *r* as in *fear, fearing* >ſι, >ſιωſ˔ɹ, there is no raising of the tongue, and the ſ itself is often lowered—>ſ˔ι. In Scotch, Irish and American-English, as well as in North-English educated speech, *sea* etc. keep the old long narrow undiphthongic ſ˔—sſ˔. Scotch also has it before *r*, as in >ſ˔ωɩ. In Scotch strong ſ is lowered, as in sſ˔ʊ *sit*, sounding to an English ear like *set*, which in Scotch has ɩ (197).

197. [, mid-front-wide. ꟻ[ɔ *men*; s[ɾ˔ *say*, ʊ[ɾ˔ɑ *take*. In *say*, etc. the tongue begins to rise as soon as the [position is assumed, and goes on rising gradually till the ɾ˔ position is reached. American-English has the same sound, sometimes raising the tongue to the full high position—s[ɾ. Scotch keeps the old monophthongic narrow vowel—s[˔—which in Edinburgh is raised towards ſ—s[˔˔—sounding to an English ear almost like *see*. In the North of England the first element of the diphthong seems to be narrow—s[ɾ˔. In Cockney English the first element is broadened into ʅ, so that *say* is confounded with *sigh* sʅɾ˔, except when the latter is broadened into sʃɾ˔ (193). In North-English and Scotch the short vowel in *men* is the broad ɩ.

198. ɩ, low-front-narrow. Only before *r*, as in ɑɩɭ *care*, where Scotch has ɾ‹.

199. ɩ, low-front-wide. ɵɩɑ *back*, ᴦɩɔ *man*. This vowel is often modified slightly in the direction either of ɟ or of ɾ, into which latter it often passes completely in Cockney, as in ɑɾɵ, ɑɾ‹ɵ *cab*.

200. ł, high-back-wide-round. ɵłɑ *book*, ›łω *full*; ʊłɜ *two, too*, ɔɷłɜ *new*. In North-English, Scotch, and in Irish and American-English the old narrow ł‹ is preserved in ʊł‹, ɔɷł‹. Scotch has also narrow short ł in ɵłɑ. In Cockney English łɜ often becomes ƭɜ with the high-mixed vowel, especially after ɷ, as in ɷƭɜ *you*, the ɷ being dropped in Cockney English after a consonant, as in ɔłɜ, ɔƭɜ. Unstressed ƭ is regular in educated as well as vulgar speech, as in ƨłɜωƭɜ *Zulu* (where the second ɜ is very indistinct), ›ɩωɷƭ *value*. Monophthongic ł‹ is kept before *r*, as in ʊłɭ *poor*, ɑɷłɭ *cure*, where Scotch has ł‹—ʊł‹ωɾ. In Cockney English łɭ is broadened to ɟ‹(ɭ), so that *poor* is levelled under *pour*. Even in educated speech there is a tendency to lower ł before *r*: the strong form of *your*, *yours* is sometimes ɷɫɭ, ɷɫɭs with the mid-mixed vowels which otherwise occur only in weak forms, but often ɷɟɭ, ɷɟ‹s with the full Cockney form.

201. ɟɘ›, mid-back-wide-round. sɟɘ› *so, sow*. The second element of this diphthong is formed by a gradual narrowing of the lip-opening to the ł-position, which begins almost as soon as the ɟ itself, the position of the tongue remaining unchanged. In weak syllables, as in the second one of sɟɘ›ωɫɘ› *solo*, the tongue is advanced to the mixed position, the diphthongic character of the sound becoming almost imperceptible. This change often takes place in stressed syllables as well, where it is often used in polite or conciliatory address; thus }ɘ› ɔ}ɘ and ɫɤ› ɔɫɤ = *oh no* may be heard from the same speaker, the former in more decided and dogmatic statements. The constant use of ɫ gives a character of effeminacy or affectation to the pronunciation. In Cockney English the first element is unrounded and the second lowered and partially unrounded—]ɤ ɔ]ɤ. Scotch keeps the old monophthong }ᵻ—s}ᵻ.

The first element of the diphthong }ɾ in *boy* is sometimes lowered to ɟ as in *not*.

202. ɟᵻ, low-back-narrow-round. sɟᵻ *saw*, ɔɟᵻɑ *naught*. In the formation of this vowel the tongue is gradually relaxed to the mixed position, the rounding being maintained, so that it might be written ɟɤ, as in sɟɤ *saw* distinct from sɟɩ *soar*. In Scotch this vowel is generally made into }ᵻ.

203. ɟ, low-back-wide-round. ɔɟɑ *not*. Scotch substitutes }—ɔ}ɑ. American-English has sometimes }—which seems often to verge on the mixed ɫ—sometimes the unrounded] of *father*—ɔ]ɑ *not*, >]ɷɫ *follow*. Weak short *o* becomes ɫ, as in ɫɑ·ɑ}ɘ›ɵɩ *October*.

204. Although weak vowels are generally levelled under ɩ or ɾ or the rarer ƭ and ɫ, the vowels and diphthongs], ɩɾ, ɟɤ, ɼ, ɩ, etc. can all occur in perfectly unstressed syllables, as in ɐ]ɼɵ]ɵ, ɑɘɩɾɷɩɾɑ, ɑɟɼɑɟɤɔɷ, ɾɔsɼɑɑ, ɩɵsɑɷɩɑɑ *humbug, twilight, compound, insect, abstract* (adj.). But if we compare the strong and weak vowels in these words, we shall find that the weak vowels all show a slight shifting toward the mid-mixed position, though hardly enough to justify the addition of a modifier. Just as all weak ſs pass into ſ˔, so also all weak ʅ˔ſ˔s pass into ʅ˔ſ˔. Weak ſ˔ itself in very rapid speech seems to tend to the mixed position, especially after ʋ preceded by a consonant (196).

CONSONANTS.

205. The English consonants are as follows:

ϱ		ɷ	ω	ʋ, ʋ	s, s	ƨ, ƨ		ɔ, ɔ	>, >
—					ω				
	ɑ, ɑ				ʊ, ʊ		ɒ, ɒ		
—	ɟ				ɿ		F		

206. The Broad Romic equivalents are:

b = ɒ *as in* bee.
d = ʊ „ day.
ð (dh) = ʋ „ then.
f = > „ fall.
g = ɑ „ go.
h = ϱ „ house.
j = ɷ „ you.
k = ɑ „ come.
l = ω „ look.
m = F „ man.
n = ɿ „ no.

ŋ	=	ɹ	*as in*	sing.
p	=	ɒ	„	pay.
r	=	ω	„	red.
s	=	s	„	say.
ʃ (sh)	=	ɛ	„	ship.
t	=	ᴖ	„	ten.
þ (th)	=	ᴗ	„	thin.
v	=	ᗒ	„	view.
w	=	ɜ	„	we.
wh	=	ɔ	„	why.
z	=	s	„	zeal.
ʒ	=	ɛ	„	rouge.

207. The point consonants ω, ᴖ, ϖ, ⅂ seem to be blade consonants—ωɩ, ᴖɩ, ϖɩ, ⅂ɩ, ᴖɩ being equivalent to sı, as we see in comparing the tongue position in *so* and *toe*.

208. The voiceless stops are all breath-glide stops—ɑ•]ꟻ, etc. (126 *a*). The buzzes ᴗ, s, ɛ, ᗒ are often whispered (137)—ᴗ', etc.

We will now consider some of the consonants more in detail.

209. ȣ, aspirate. ȣ]ᵻs *house*, ȣ[ɷ *he*, ȣɫɜ *who*. ȣ is dropped—that is to say, its stress is shifted on to the vowel (120)—in Cockney English and in most of the English dialects, being always kept in Scotch, Irish, and American-English. In natural speech it is always dropped in weak syllables when not initial, as -ʅɾ sɿ• -[ꟻ *I saw him*, where, however, the dread of vulgarism often leads to its insertion, especially in 'ladies' English.'

210. ɷ, front-open-voice. ɷɫɜ *you*, ꟻ[ωɷʅ⅂ *million*.

In such words as *hue, humor* the aspirate precedes the ɷ as if it were a vowel—ϱɷlɜ, ϱɷlɜɾ˥, but in Scotch the combination ϱɷ is made into ɒ—ɒlɩ. The nearest approach to this sound in Southern English is in such words as *pure* ɒɒ)ɷ)lɩ (144).

211. ω, point-open-voice. ωʗɷ *red*, ωʃɩωʗɜ *rearing*. This consonant is practically a vowel, there being no buzz in it, even when emphasized and lengthened. It never occurs except before a vowel, being elsewhere weakened into a voice glide, as in ωʃɩ, ωʃɩɷ *rear*, *reared*. It is sometimes rounded into ω›. Trilling—'rolling one's *r*s'—is a defect of pronunciation, which is however often affected on the stage and in recitation. The substitution of the back open ϵ, which is sometimes trilled—ϵʃ—is a frequent individual peculiarity. ϵʃ is the 'Northumbrian burr.' In Scotch *r* is a strong trill everywhere: ωʃʃɩωʃ, ωʃʃωʃɷ. So also often in Ireland, where also sounds similar to the Norwegian 'thick *l*' (147) may be heard. In American-English *r* before a pause or a consonant appears as a point-modification of the preceding vowel, as in >]ɩ\ *far*, being completely lost in other American pronunciations. ω is always formed in the inner position (75), and in the dialects of the West of England ω˧ is exaggerated into ωc (71 *c*).

212. ᴗ, ɯ, point-teeth-(voice). ᴗʃɜ *thin*, ɯʗɜ *then*. In these consonants it is enough that the breath is directed on to the teeth by the tip of the tongue, which need not itself be brought against the teeth. Certainly the most distinct form of these consonants is that produced by placing the tip of the tongue firmly on the back of the upper teeth and forcing the breath partly between the interstices of the teeth, partly between the sides of the tongue-tip and the surface of the teeth; but they can be—and are often—formed by bringing the tongue against the gums in the s-place without touching the teeth. In the latter formation the contact is of course very slight. Weak ʋ, ɯ are formed without any contact. Irish-English substitutes its peculiar 'rim-stops' for ʋ and ɯ, in whose formation the point of the tongue is spread out like a fan, so the whole of its rim is brought against the teeth or gums together with the point, the back of the tongue being slightly raised at the same time: ɔɪкʃɾ, ɷɪк[ɾ.

s, s, blade-open. sʃɷ *see*, sʃɷɷ *zeal*.

213. ƨ, ɛ, blade-point-open. ƨʃɔ *ship*, ɷɫɜɛ *rouge*. These consonants are formed more inwards than s (75), but after the point-blade consonants ɔ, ɷ they are less retracted, as in ɑ[ɔƨ ɷɛɟɾ *catch John*. If we drop the ɔ in ɑ[ɔƨ we can feel the difference between the resulting ɑ[ƨ+ and ɑ[ƨ = *cash*: ƨ+ has a sound intermediate between ƨ and s.

214. ɜ, ɜ, lip-back-open. ɜ[ɾ *why*, ɜʃɷ *we*. These consonants are practically ɫ:ʌ, ɫʌ, being wide (66). In Southern-English ɜ generally becomes ɜ, but it seems probable that ɜ will be completely restored in a few generations.

215. >, >, lip-teeth-open. >ɟ+ɷ *fall*, >ɷɫɜ *view*.

216. ɷ, point-side-voice. ɷɫɑ *look*. In this consonant the English concavity of the fore part of the tongue (185) is especially noticeable. In Cockney English and in Scotch *l* has a still deeper tone which may be sometimes the result of back modification—ωϲ.

217. ɑ, ɑ, back-stop. ɑ]ꜰ *come*, ɑ}ɜ) *go*.

218. ʊ, ʊ, point-stop (blade-stop). ʊ[ˀ *ten*, ʊ[ɾ *day*.

219. ɒ, ɒ, lip-stop. ɒ[ɾ *pay*, ɒſɷ *bee*.

220. ɹ, back-nasal-voice. sſɹ *sing*.

221. ˀ. point-nasal-voice. ˀ}ɜ) *no*.

222. ꜰ, lip-nasal-voice. ꜰ[ˀ *man*. ⪢ɪſ. lip-teeth-nasal-voice in *nymph* (142).

SYNTHESIS.

223. For the English synthesis and organic basis see §§ 98, 99, 105, 185 and the section on Synthesis generally.

SPECIMENS.

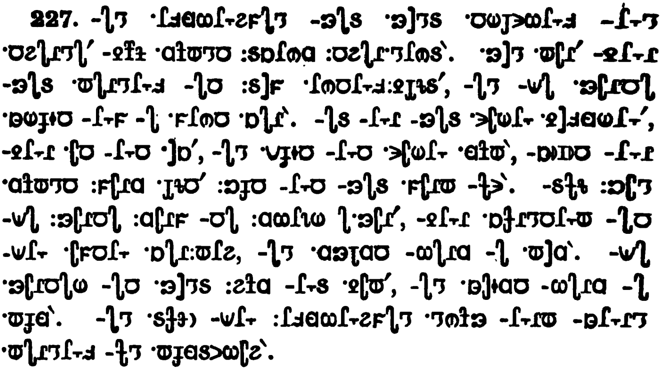
Of the three following texts the first two are accompanied by a Broad Romic transcription, the ordinary spelling of the first being also added.

224. :ɒſɷɒω ·ɷɪɔs -ʊ\] :ʋſɹɑ -ʋſ- ·ɪɪʋ -ɜ\]s -\] :ɑ\]ɾˀʊ -\]⪢ ⪢ωɪʊ ·ɑ[ɾɑ\`, -ɜſ-ʋ -ʋ\] ·sſɷ -ɪ·ω ·ωɪɪˀʊ -ſ-ʊ\`; -ɒɪɒʊ -ɜſ-ɾ ·ˀ}ɜ) ·ˀɪɪ -ʋ\]ʊ -ſ-ʊs ·ω\]ιωſ- ;ωɪɪˀʊ\`, :ω\]ɾɑ -\] ·ɒɪɪω\`—·ˀɪʊ ᵛ·ɑɜ\]ɾʊ :ωɪɪˀʊ′, -ɒɪɒʊ -\] :ωſʊω ·⪢ωɪʊˀʊ\`, :ω\]ɾɑ -\]ˀ ·ɪωſ-ˀɛ\`.

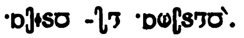
225. :pijpl ·juws -tə :þiŋk -ði ·əəþ -wəz -ə :kaind -əv ·flæt ·keik\`, -wið -ðə ·sij -ol ·raund -it\` ; -bət -wij ·nou ·nau -ðət -its ·riəli ;raund\`, :laik -ə ·bol\`—·not ᵛ·kwait :raund′, -bət -ə :litl ·flætnd\`, :laik -ən ·orinʒ\`.

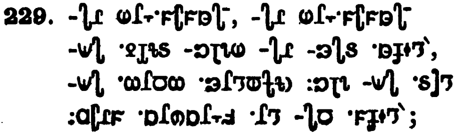
226. People used to think the earth was a kind of flat cake, with the sea all round it; but we know now

that it is really round, like a ball—not quite round, but a little flattened, like an orange.



228. -ən ·iŋgliʃmən -wəz ·wɐns ·trævliŋ -in ·tʃainə′ -huw ·kudnt :spijk :tʃai·nijz`. ·wɐn ·dei′ -hij -wəz ·dainiŋ -ət :sɐm ·ijtiŋ:haus′, -ən -ðə ·weitə ·brɔt -im -ə ·mijt ·paiˆ. -əz -ij -wəz ·veri ·hɐŋgri′, -hij ·et -it ·ɐp′, -ən ·þɔt -it ·veri ·gudˆ, -bət -ij ·kudnt :meik ·aut′ :whot -it -wəz ·meid -ov`. -sou :when -ðə :weitə :keim -tə :kliər ə·wei′, -hij ·pointid -ət -ði ·emti ·pai:diʃ′, -ən ·kwækt -laik -ə ·dak`. -ðə ·weitər -ət ·wans :ʃuk -iz ·hed′, -ən ·baakt -laik -ə ·dog`. -ən ·sou -ði :iŋgliʃmən ·njuw -ijd -bijn ·dainiŋ -on ·dogzfleʃˆ.





-ɐ[ᵣɾ ·ʖ[ᐅ] :ɑ[ɾꟻ -] ;ɘ[ɟɑ :ʊƚɜ ·sƚɜʖ̀,
-ʖɟ• ·ɵωɟ•ʊ :ʊƚɜ ·ωɟɟ -] ·ʊ[ɾ̀;
-ɒ•ɒʊ ·ʖɪᵻ -]ɾ ·ɟ•ᐳʖ ·ɘ[ƨ -ѵ] ·ʖ]ɾʊ
-]ʊ ·ɵɟ•ʖ -ꟻ]ɾ ·ɵω[ѵ]·ɘ[ɾ̀.

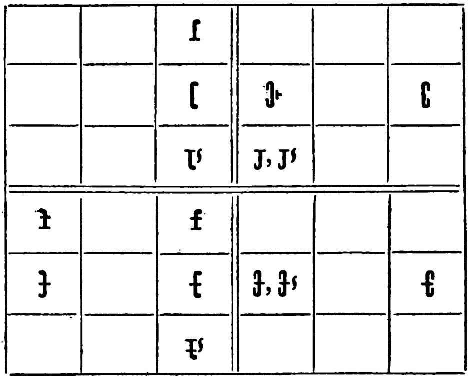
230. -]ɾ ω[ᵣ·ꟻ[ꟻɵ]̄, -]ɾ ω[ᵣ·ꟻ[ꟻɵ]̄
-ѵ] ·ωƚɜ)s[ᵣs, ·ω[ʊ -]ʖ ·ɔ]ɾʊ̀,
-ѵ] ·ᐅ]ɾɩω[ᵣʊs -]ʖ -ѵ] ·ω[ω[ᵣ·ɑ]ɒs̀—
-ѵƚᵻ)s ·ᐳωɪᵻs :ꟻ[ɾʊ -]ᐅ ·ω]ɾʊ !̀
-ѵ] ·ω]ɾω]ɑs -ɔɪɩ -ѵ] ·ωɟɵ[ᵣʖs ·ɵ[ωʊ̀,
-]ʖ :ɔɪɩ -ꟻ]ɾ ·ɵω]ѵ] ·s[ʊ́
-ѵ] ω]·ɵɪ•ʖ]ꟻ -ƚʖ -[ᵣs ·ɵɪ•ѵʊ[ɾ̀,— -
-ѵ] ·ʊω[ɷ -[ᵣs ·ω[ᐅ[ᵣɟ ;ɷ[ʊ̀!

231. -]ɾ ω[ᵣ·ꟻ[ꟻɵ]̄, -]ɾ ω[ᵣ·ꟻ[ꟻɵ]̄
-ɔɪω -]ɾ -ɘ]s :ɷƚɜs -ʊ] ·sɘ[ɟ́,
-]ʖ ·ѵɟ•ʊ -ѵ[ᵣ ·ɪɩ -ꟻ]sʊ ·ω]ƨ -]s ·ᐳω[ƨ
-ʊ] ·sɘɟωƚᵻs -ƚʖ -ѵ] ·ɘ[ɟ̀;
-ꟻ]ɾ ·sɒ[ω[ᵣʊ :ᐳωƚɔ -[ᵣʖ ·ᐳ[ѵ]s :ѵ[ʖ̀,
-ѵ]ʊ :[s -ɕƚᵻ) ·ɐ[ᐅ[ᵣ ··ʖɪᵻ̀,
-]ʖ ·s]ꟻ] ·ɒƚɜωs -ɑ]ʊ ·sɑɪɩsω[ᵣ ·ɑƚɜω
-ѵ] ·ᐳ[ɷᐅ]ω -ƚʖ -ꟻ]ɾ :ɵωɪᵻ.

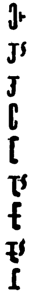
232. -]ɾ ω[ᵣ·ꟻ[ꟻɵ]̄, -]ɾ ω[ᵣ·ꟻ[ꟻɵ]̄
-ѵ] ·ᐳɪ•ʊω[ᵣɾs ·ʊ]•ɑ -]ʖ ·ɐ]ɾ̀;
-]ɾ ·ɷƚɔs -ʊ] ·ѵ[ɟɑ -ѵɪɩ ·sω[ʖʊ] ·ʊɟɒs
-ɘ] ·ɑωƚɜ)s]:ɘ[ʖsʊ -ѵ] ·sɑ]ɾ̀:
-[ᵣʊ -ɘ]s -] ·ʊƨ]ɾωʊ[ᵣƨ ·[ɘʖ]ω]ʖs̀,
-ɒ•ɒʊ ·ʖɪᵻ -ʊ[ᵣs ·ω[ʊɷ ·ʊƨƚɾ
-ʊ] ·ʖƚɜ),-]ɾꟻ :ᐳɪ•ѵ]ω ·ɟ•ᐳ -ᐳω]ꟻ ·ɐ]ᐅʖ
-ѵ]ʖ :ɔ[ʖ -]ɾ -ɘ]s -] ·ɵƚɾ.

FRENCH SOUNDS.

233. VOWELS.



234.



a = *as in* patte.
aŋ = „ sang.
ɐ = „ pâte.
æ = „ père.
e = „ été.
eŋ = „ vin.
ɵ = „ peu.
ɵŋ = „ un.
i = „ fini.

o = } *as in* beau.
oŋ = }ɾ „ son.
ɔ = } „ or.
œ = ʗ „ peur.
u = ɫ „ sou.
y = f „ lune.

235. For the French organic basis see § 186.

236. The quantity of French vowels is often undetermined, half-length predominating. Final vowels are short, as in *fini*, *son*; except in exclamations, such as ɟɫ *ah.* Vowels are lengthened before *r* and voiced consonants generally. Nasal vowels are short finally, long before another consonant, as in s}ɾ *son*, >}ɫɾʊɫ *fonte.*

237.]ɫ, mid-back-wide-outer. ɒ'ɟɫʊ *patte*, ɒ'ɟɫɫεɫ *page.* This is a vowel intermediate both in formation and acoustic effect to the English] in *part* and ɩ in *pat.*

238. ɟ, low-back-wide. ɒ'ɟ *pas*, ɒ'ɟɫʊɫ *pâte.* This sound is easily obtained by unrounding the English ɟ in *pot*, taking care not to muffle the sound.

239. ɟɾ, low-back-wide-nasal. sɟɾ *sang*, ɟɫɾε *ange.* For French nasality see § 46.

240. ɾ, high-front-narrow. >ɾʊɾ *fini.*

241. [, mid-front-narrow. [ʊ[*été.*

242. [, mid-front-wide. ɒ[ɫɛɫ *père.* In some pronunciations this vowel appears to be lowered [or even full ɩ.

243. ɩɾ, low-front-narrow-nasal. >ɩɾ *vin.* May perhaps be wide = English ɩ in *man.*

244. ɫ, high-back-narrow-round. sɫ *sou.* Often advanced towards the mixed f.

245. }, mid-back-narrow-round. ɒ} *beau.*

246. }, mid-back-wide-round. }˫Є˧ *or.* Often advanced to the mixed position ʈ, as in ɑ'ʈꟻɿʃ *comment.* Sometimes pronounced as a lowered }.

247. }ʃ, mid-back-wide-round-nasal. S}ʃ *son.*

248. f, high-front-narrow-round. ωfɿ *lune.*

249. {, mid-front-narrow-round. ɒ'{ *peu.*

250. {, mid-front-wide-round. ɒ'{˫Є˧ *peur.* Sometimes pronounced as lowered { or full ɪ. The weak vowel in *le* seems to be a slightly retracted and partially unrounded { = [˧).

251. ɪʃ, low-front-narrow-round-nasal. ɪʃ *un.* May be wide—ɪʃ.

252. CONSONANTS.

ϱ	C˧, Є˧	∩, ⋒		S˫, S˫	ƻ˫, ƻ˫	Ɔ\, Ɛ\	Ɔ, Ɛ	>, ⋗
			ω˫, ω˫					
	ɑ, ɑ		ʊ˫, ʊ˫			ɒ, ɒ		
		ɩ	ɿ˫			ꟻ		

253.
b = ɒ *as in* bon.
β = Ɛ\ „ buis.
ç = ∩ „ pied.
d = ʊ „ doux.
f = > „ fin.
g = ɑ „ gout.
h = ϱ

j = ɷ *as in* briller.
k = ɑ " qui.
l = ꞷ " belle.
lh = ω " table.
m = ϝ " mon.
n = ʒ " non.
ñ = ʆ " agneau.
p = ɒ " Paris.
φ = ɔ\ " puits.
r = є " rare.
rh = c " quatre.
s = s " sou.
ʃ = ƨ " chat.
t = ʊ " tout.
v = > " vin.
w = ɜ " oui.
ʍ = ɞ " poids.
z = ȣ " zèle.
ʒ = ɛ " jour.

254. ǫ, aspirate. This sound is formed only occasionally and involuntarily as a hiatus-filler, as in >ω[ǫ} *fléau*, ω]ǫ} *là-haut*.

255. c⊣, є⊣, back-open-inner. є⊣]⊦є⊣ *rare*. This, which is only an individual peculiarity in English, is the regular sound of *r* in French. It does not seem to be generally trilled. The point ωɩ sometimes occurs, and is always trilled. At the end of a word after a consonant *r* is unvoiced, and often dropped entirely, as in ɑ]⊦ʊc⊣, ɑ]⊦ʊ. After a breath consonant—especially a breath stop—it is sometimes fully, sometimes partially unvoiced, as in ɒcʗ, ɒc)ɛ)ʗ *près*. These remarks apply also to ɷ, ɔ\, and ꞓ.

256. ɒ, ɷ, front-open. ɞɛɪɷʗ *briller*, ɒɒʗ *pied*. Final ɷ unvoices its latter half, as in >ɪɷ)ɒ), >ɪɷ: *fille*. In connection with the vowel ɪ, as in *briller* and *fille*, ɷ is a consonantal ɪ, but after more open vowels it appears to be lowered to the ʗ position and to be retracted somewhat.

257. s˫, s˫, blade-open-outer. sɪ *sou*, sʗɷ *zèle*. These consonants sound clearer than in English, partly because of the greater convexity of the tongue in French, partly because they are formed with the tongue nearer the teeth than in English.

258. ƨ˫, ƨ˫, blade-point-outer. ƨʝ *chat*, ƨɪɛ˧ *jour*. The same remarks apply to these consonants as to s and s.

259. ɔ\, ɔ\, lip-front-open. ɞɔɪ *buis*, ɒɔɪ *puits*. In these words we have a consonantal ɪ, the tongue being lowered after other than high vowels, as with ɷ.

260. ꞓ, ꞓ, lip-back-open. ꞓɪ *oui*, ɒꞓɹ *poids*. In the former of these words we have a consonantal ɪ, in the latter rather a consonantal ʝ), and so before other open vowels.

261. >, >, lip-divided. >ɪʃ *fin*, >ɪʃ *vin*.

262. ɷ˫, ɷ˫, point-divided-teeth. ɞʗɷ *belle*, ʊʝɞɷ. The unvoicing of this consonant is parallel to that of ɛ. The point consonants ɷ, ʊ, ʊ, ɿ are all formed against the teeth, the fore part of the tongue not being hollowed as in English (185), so that the French *l* has a palatal effect to an English ear.

263. ɑ, ɑ̈, back-stop. ɑ'ɪ *qui*, ɑ̈ɩ *gout*. The voiceless stops ɑ, ʊ, ɒ are followed by voice-glides, there being no escape of breath as in English (126 *a*); hence *qui* often suggests *gi* to an English ear. Initial ɑ̈, ʊ̈, ɒ̈ are pronounced with full vocality (126 *d*), which suggests (ŋ) etc. to an English ear. Final voice consonants often end in a voice-glide, as in ɒ̈]ɪɑ̈' *bague*. Even with voiceless consonants this is sometimes the case.

ʊ⊦, ʊ̈⊦, point-stop-teeth. ʊ'ɩ *tout*, ʊ̈ɩ *doux*.

264. ɒ, ɒ̈, lip-stop. ɒ']ɛɪɪ *Paris*, ɒ̈}ʃ *bon*.

265. ɭ, front-nasal-voice.]ɭ} *agneau*, ɒ̈ɩɷ}ɭ *Boulogne*. Like ɷ this consonant ends voicelessly, as in ɜɪɭ: *vigne*. In vulgar speech it is retracted nearly to the ɹ⊦ position of the English *ng* in *sing*. It is sometimes formed with imperfect stoppage, giving ɷʃ.

266. ɿ⊦, point-teeth-nasal-voice. ɿ}ʃ *non*.

267. ɾ, lip-nasal-voice. ɾ}ʃ *mon*.

268. Double consonants occur only in learned and foreign words such as *immense* ɪɾɾɿɪʃs.

269. Stops are joined with glides, as in]ɑ•ʊ *acte*, except when the same consonant is repeated in two different words, as in ɑɩɒɒɿ *coupe pas*.

SYNTHESIS.

270. French synthesis is very rudimentary as regards quantity and stress. Frenchmen are unable without long training to distinguish vowel-quantity, stress, and syllable-division in foreign languages.

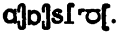
271. In French every syllable is uttered with almost even stress, which is always open (159), so that such a word as *capacité* is divided ·ɑꞌǀ·ɒꞌǀ·sɪ·ʊꞌ[.

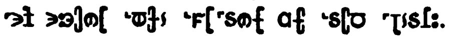
272. In French there is no such thing as word-stress or word-division. Sentences are cut up into syllables without any regard to the structure of the words they are made up of. Thus the sentence *quel âge a-t-il?* is pronounced (kæ lɐɐ ʒa til).

273. Although stress is nearly even, there is a distinct tendency to weaken the stress of the last syllable of a syllable-group, whether it consists of one or more words. This is regularly the case when the last syllable is uttered with a falling tone, when it is often pronounced with breath instead of voice, as in ƪɪ ɒʆʃ˞sʄʃ ɒɷɫ: *n'y pensons plus*. So also the word-group ·ɷǀɷfɔ *la lune* takes the stress on the first syllable when pronounced with a falling tone, while in *le soleil* ɷʄ·sʄɷ[ɷ: it falls not on the article but on the first syllable of *soleil*, because that syllable happens to be the last but one. In the French pronunciation of *home, sweet home!* as :ʇɾ˞·sɨ)ɪ:ʊꞌʇɾ we can observe the three main features of French synthesis—want of determinate quality, monotonous syllable-division, and illogical stress.

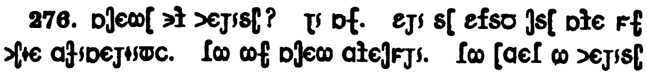
274. Frenchmen, in fact, generally have no idea of where they put the stress. But they have a tendency to stress *intensitive* words, as in ·ʊc[ɒɷʅʃ *très-bien*, ·ɑꞌ[ɷ sfɒɷɪs *quel supplice!* and often (though not always) mark antithesis by stress, as in *ce n'est pas lui, c'est moi*, where *lui* and *moi* have an extra stress.

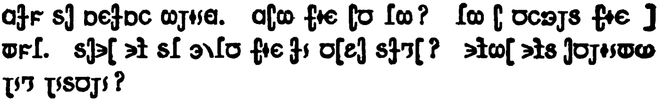
275. Stress in French is, as we see, greatly dependant on *intonation*, which is the most important factor in

French synthesis. French intonation goes more in leaps than by glides, and the intervals are considerable, which together give it a peculiarly lively character. Isolated words are pronounced with a rise on the last syllable, as in . In a sentence they keep this high tone when emphatic. Doubt, question, etc. are expressed by a rise, as in English, as also lively statement, a falling tone being frequent in statements, answers, commands, etc. High tone is often accompanied—though not necessarily—by increased stress. In French there is a tendency to alternate high and low tone in the same way as other languages alternate strong and weak stress, so that a low tone in a subordinate syllable often appears as a kind of preparation for an emphatic high tone. Thus in the sentence *vous voyez donc messieurs, que c'est ainsi*, the highest tone is on the first syllable of *ainsi*, the lowest tone being on the one immediately before it—*c'est*. The next prominent syllable before *c'est* is the last of *messieurs*, which accordingly has a high tone—though not so high as that on the first syllable of *ainsi*. The first word in the sentence—*vous*—has a tone of about the same height as the second syllable of *messieurs*, from which the tone descends by short leaps to *donc mes-* whence it leaps up to *-sieurs*:



SPECIMENS.

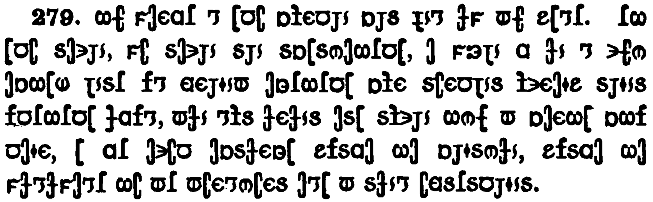
276. 



277. parle vu fraŋsæ? əŋ pə. ʒaŋ se ʒyst ase pur mœ̣ fæær koŋpraaŋdrh. il lœ parl kuramaŋ. il ekri l fraŋsæ kɔm sa prɔprh laaŋg. kæl œœr æt il? il æ trwez œœr e dmi. save vu si *β*it œœr oŋ deʒa sɔne? vule vuz ataaŋdr əŋ eŋstaŋ?

278. Parlez-vous français? Un peu. J'en sais juste assez pour me faire comprendre. Il le parle couramment. Il écrit le français comme sa propre langue. Quelle heure est-il? Il est trois heures et demie. Savez-vous si huit heures ont déjà sonné? Voulez-vous attendre un instant?

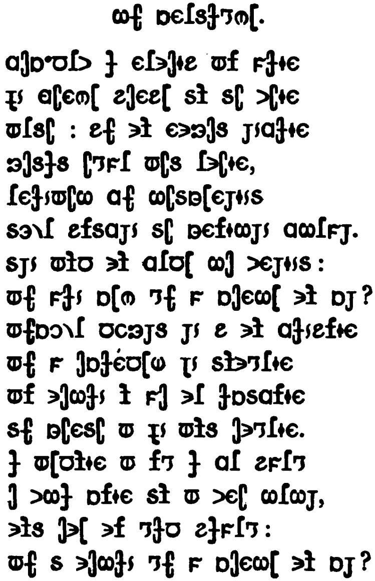
279.



280. lœ marki n etæ purtaŋ pez əŋn om dœ ʒeni. il etæ savaŋ, mæ savaŋ saŋ spesjalite, a mweŋ k oŋ n vœj apler eŋsi yn graaŋd abilite pur særteŋz uvraaʒ saaŋz ytilite okyn, doŋ nuz ɔroŋz ase suvaŋ ljə d parle ply taar, e ki avæt apsɔrbe ʒyska la peesjoŋ, ʒyska la mɔnɔmani læ di dærnjærz ane d sɔŋn ægzistaaŋs.

281. Le marquis n'était pourtant pas un homme de génie. Il était savant, mais savant sans spécialité, à moins qu'on ne veuille appeler ainsi une grande habilité pour certains ouvrages sans utilité aucune, dont nous aurons assez souvent lieu de parler plus tard, et qui avaient absorbé jusqu'à la passion, jusqu'à la monomanie, les dix dernières années de son existence.

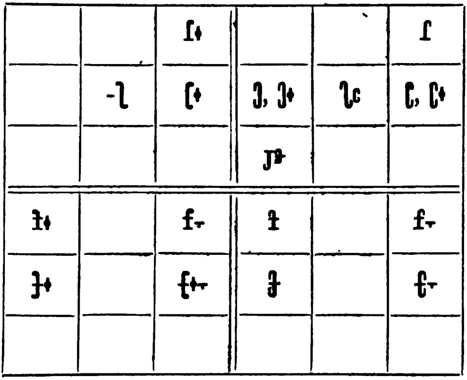
282.



NORTH GERMAN.

283.

VOWELS.



284. a = *as in* mann.
aa = „ name.
ai = „ mein.
au = „ haus.
e = „ fest.
ee = „ see.
ee = „ thräne.
ə = „ gerettet.
əə = „ schön.
i = „ bin.

ii = ſ♦ *as in* biene.
o = ɟ „ sonne.
oo = ɟ♦ „ sohn.
oy = ɟɵ „ häuser.
œ = ʄ „ götter.
u = ŧ „ hund.
uu = ŧ♦ „ gut.
y = f „ schützen.
yy = f♦ „ grün.

285. ʝ, mid-back-wide. ꜰʝɿ *mann*, ɿʝ♦ꜰʅ *name.* In some parts of North Germany (Hanover, etc.) ʝ⊦, ʝ♦⊦. In Middle and South Germany (Saxony, Bavaria, etc.) ȷ, ȷ♦ or ȷ, ȷ♦. The low-back-wide ȷ is usual in North German in the diphthong ȷɵ, as in ɐȷɵs. Observe that the second elements of the diphthongs ʝc, ȷɵ, ɟɵ are generally lowered even more than in English, being apparently sometimes narrow, sometimes wide.

286. ʅ, mid-mixed-narrow. Only in unstressed syllables, as in ɐʅ·ɛʃʊʅʊ. In rapid speech this vowel loses its definite configuration, and becomes a mere voice-glide, which is perhaps wide. It varies in different parts of Germany. In South German it becomes ʃ.

287. ʅ, mid-mixed-wide. Occurs only in the diphthong ʅc, as in ꜰʅcɿ *mein*, which has almost the same sound as in English *mine.* In Hanover and elsewhere it is broadened into ʝc.

288. ſ♦, high-front-narrow. ɒſ♦ɿʅ *biene.*

289. ſ, high-front-wide. ɒſɿ *bin.* Tends to ɪ in some parts of North Germany.

290. ʃ♦, mid-front-narrow. sʃ♦ *see.*

291. [, mid-front-wide. >[sɷ *fest*, ɔɛ[ɫ˥l *thräne.* In many parts of North Germany long *ä* is narrowed to [ɫ, but this pronunciation seems to be still felt as a provincialism.

292. ɫɫ, high-back-narrow-round. ɑɫɫɷ *gut.*

293. ɫ, high-back-wide-round. ɤɫ˥ɷ *hund.*

294. }ɫ, mid-back-narrow-round. ɜ}ɫ˥ *sohn.*

295. }, mid-back-wide-round. ɜ}˥l *sonne.* } in South Germany. The diphthong *eu*, *äu* is generally }ɵ with slight rounding of the second element, but often }c, practically identical with the English *oi.*

296. fɫ˗, mid-front-narrow with high rounding. ɑcfɫ˥ *grün.* Might be written {). In all the German round-vowels the rounding is a degree higher than the tongue-position. Pure fɫ is heard in the Middle and South German artificial pronunciation of long *ü*, which generally becomes ſɫ in Middle and South German. Even in North German the tongue lowering—which seems often to be partly retraction—is less in some pronunciations than in others.

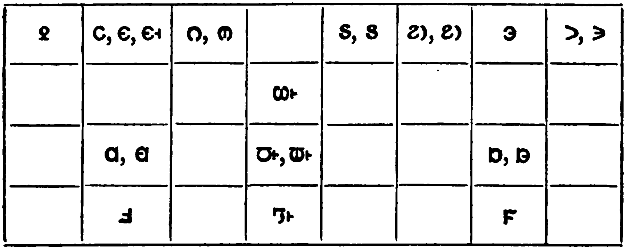
297. f˗, mid-front-wide with high rounding. ƨ)fɷɜ˥ *schützen.* Becomes ſ in Middle and South German.

298. {ɫ˗, Low-front-narrow with mid rounding. ƨ){ɫ˥ *schön.* Often wide in North German. Becomes [ɫ in Middle and South German.

299. {˗, Low-front-wide with mid rounding. ɑ{ɷlɛ *götter.* This vowel is got by over-rounding the English vowel in *man.*

300. Initial vowels have the clear beginning (119 *b*), as in -ˈlc˥l ˈ]ɷɷl ˈlcɔl *eine alte eiche.*

301. CONSONANTS.



ƨ	C, Є, Є⊣	∩, ო		S, S	Ƨ), Ƨ)	϶	>, ⋗
			ω⊦				
	ɑ, ꬰ		℧⊦, ϖ⊦			D, Ɵ	
	⅃		ℷ⊦			F	

302.
b = Ɵ *as in* bin.
ç = ∩ „ ich.
d = ϖ „ du.
f = > „ voll.
g = ꬰ „ gut.
ʒ = Є „ sage.
h = ƨ „ hat.
j = ო „ ja.
k = ɑ „ komm.
l = ω „ lang.
m = F „ mann.
n = ℷ „ nun.
ŋ = ⅃ „ lang.
p = D „ lieb.
r = Є⊣ „ retter.
s = S „ was.
ʃ = Ƨ) „ fisch.
t = ℧ „ tun.
v = ⋗ „ was.

w = э *as in* quelle.
x = c, ɑ „ ach, auch.
z = s „ so.
ʒ = ɛ) „ courage.

303. ϱ, aspirate. ϱ]ɒ *hat.*

304. c, back-open.]c *ach.* After back-round vowels c is rounded into ɑ, as in ȷ᠊ɑ *auch.*

305. є, back-open-voice. *g* between vowels is stopped in some pronunciations (Hanover, South Germany), open in others, especially in Middle Germany, s]ᵻɑl, s]ᵻєl. The latter is considered the more correct in ordinary conversation. Final є = *g* becomes c, as in ɒ]ᵻc *tag*, which in other pronunciations appears as ɒ]ᵻɑ. The Hanoverian pronunciation is ɒ]ᵻɑl, ɒ]ᵻc, which is the easiest compromise for English people.

306. є˧, back-open-voice-inner. є˧[ɒlє˧ *retter.* This is a very soft, vocalic sound, which is not generally trilled. The point ωɪ is provincial.

307. ɲ, front-open. ʃɲ *ich.*

308. ɱ, front-open-voice. ɱ]ᵻ *ja.*

309. s, s, blade-open. >]s *was*, s}ᵻ *so.* Initial s is often formed with half voice.

310. ƨ), ɛ), blade-point-lip. >ʃƨ) *fisch*, ɑl·є]ᵻƨ)l *courage.* Differ from the corresponding English sounds in being always rounded, which allows the tongue-position to be somewhat relaxed.

311. э, lip-open-voice. ɑэ[ωl *quelle.* Often pronounced as a weak >.

312. >, >, lip-teeth. >}ω *voll*, >]s *was.* These sounds are weak, and are formed with very little buzz. In

Middle and South German ⋧ often becomes pure lip ɜ.

313. ω꜔, point-side-voice. ωʆɹ *lang.* All the point consonants approximate to dentality, the point of the tongue being often partly on the gums, partly on the teeth, the fore part of the tongue being more convex than in English.

314. ɑ̓, ɑ, back-stop. ɑ˙ʆꜰ *komm*, ɑɩƚɔ *gut.* Voiceless stops are generally followed by a strong breath glide (128) in North German. In Middle and South Germany they are followed by a voice-glide—ɑ', etc.—and the voice stops are pronounced in the same way, so that the distinction between *k* and *g*, *t* and *d*, *p* and *b* is completely lost.

315. ɔ꜔, ɷ꜔, point-stop-outer. ɔ˙ɩƚʒ *thun*, ɷɩƚ *du.*

316. ɒ, ɒ, lip-stop. ωɭƚɒ *lieb*, ɒʃʒ *bin.* The lip-teeth stop occurs in the combination *pf*, as in *pfund.*

317. ɹ, back-nasal-voice. ωʆɹ *lang.*

318. ʒ꜔, point-nasal-voice-outer. ʒɩƚʒ *nun.*

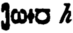
319. ꜰ, lip-nasal-voice. ꜰʆʒ *mann.*

SYNTHESIS.

320. In the combination *kn* there is often a breath glide between the consonants, as in ɑ˙ʒɭƚ *knie.*

321. Final stops are always voiceless, as in *lieb*, *hund.* In Middle and South Germany all voiced consonants—even *r* and *l*—are unvoiced, so that they are hardly audible except in the glide to or from a vowel.

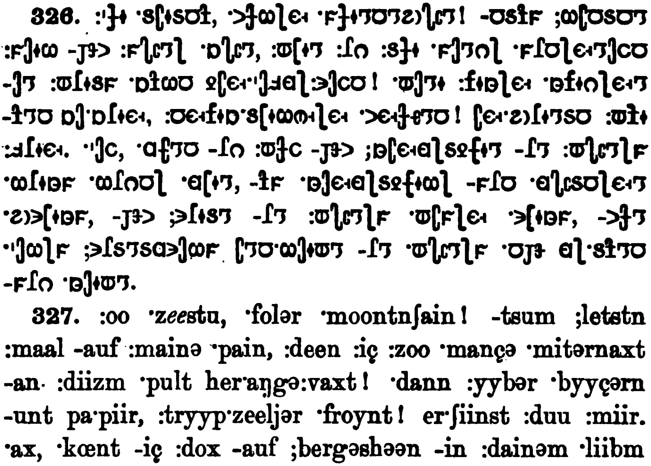
322. Long vowels are not shortened before voiceless consonants, as in English (98). Long vowels are shortened to half-long or even short under weak stress. Final consonants are always short (99).

323. Vowel-like consonants are often lengthened before breath as well as voice stops, as in  *halt.*

324. For stress see 105.

325. German intonation closely resembles English.

SPECIMENS.

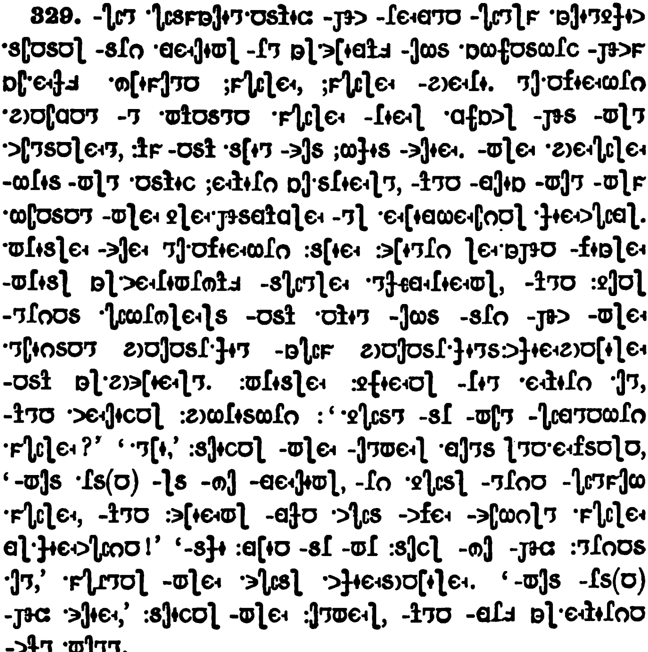
326. 

327. :oo ·*zee*stu, ·folər ·moontnʃain! -tsum ;letstn :maal -auf :mainə ·pain, :deen :iç :zoo ·mançə ·mitərnaxt -an· :diizm ·pult her·aŋgə:vaxt! ·dann :yybər ·byyçərn -unt pa·piir, :tryyp·zeeljər ·froynt! er·ʃiinst :duu :miir. ·ax, ·kœnt -iç :dox -auf ;bergəshəən -in :dainəm ·liibm ·liçtə ·geen, -um ·bergəshəələ -mit ·gaistərn ·ʃveebm, -auf ;viizn -in :dainəm ·demər ·veebm, -fon ·aləm ;visnskvalm ent·laadn -in ·dainəm ·tau gə·zunt -miç ·baadn.

328. O sähst du, voller mondenschein! zum letztenmal auf meine pein, den ich so manche mitternacht an diesem pult herangewacht! dann über büchern und papier, trübsel'ger freund! erschienst du mir. Ach!

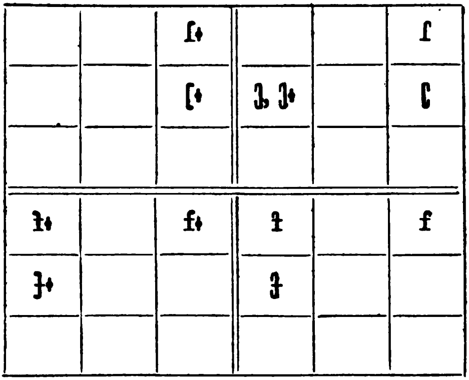
könnt'.ich doch auf bergeshöh'n in deinem lieben lichte gehn, um bergeshöhle mit geistern schweben, auf wiesen in deinem dämmer weben, von allem wissensqualm entladen, in deinem thau gesund mich baden!

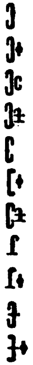
329.



LATIN SOUNDS.

330. Vowels.





a	=	*as in*	pater.
ā	=	„	māter.
ae	=	„	caelum.
au	=	„	aurum.
e	=	„	celer.
ē	=	„	trēs.
eu	=	„	heu.
i	=	„	difficilis.
ī	=	„	fīnis.
o	=	„	modo.
ō	=	„	nōlō.

oe = ʒc *as in* poena.
u = ɫ „ fluctus.
ū = ɫ⧫ „ nūbēs.
y = f „ hymnus.
ȳ = f⧫ „ gȳrus.

CONSONANTS.

ϙ		ന	Ʊʃ, ωʃ	S		ɞ	>
			ω⊦				
	ɑ, ɑᵒ, ɑ̵		Ω⊦, Ωᵒ, ϖ		D, Dᵒ, ɵ		
	⅃		ℸ⊦		F		

b = ɵ *as in* bibō.
c = ɑ „ calculus.
ch = ɑᵒ „ pulcher.
d = ϖ⊦ „ domus.
f = > „ fāma.
g = ɑ̵ „ ego.
h = ϙ „ hōra.
j = ന „ jējūnus.
l = ω⊦ „ lūdus.
m = F „ mē.
n = ℸ⊦, ⅃ „ nōn, longus.
p = D „ pater.
ph = Dᵒ „ philosophia.
q = ɑɔɜ „ quis.

r = ωʃ *as in* rārus.
rh = Oʃ ,, rhētor.
s = s ,, sīc.
t = ɒ· ,, tū.
th = ɒ·o ,, theātrum.
v = ɜ ,, vīvus.
x = ɑs ,, axis.
z = ϖs ,, zēlus.

Final *m* was assimilated in place to a following nasal or stop:

cum nobis = ɑɪℸ ℸ}·ɓʃ·s,
tam magnus = ɒ]ꜰ ꜰ]ɐℸɪs,
cum quattuor = ɑɪɹ ɑ·ɜ]ɒɒɪ}ωʃ,
decem dies = ϖ[ɑ[ℸ ϖʃ[·s,
tum pater = ɒɪꜰ ᴅ]ɒ[ωʃ;

was assimilated to *r* and *l*:

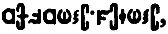
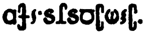
cum regibus = ɑɪωʃ ωʃ[·ɐʃɓɪs,
tam levis = ɒ]ϖ ϖ[ɜʃs,

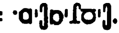
while before *h*, *j*, *v*, *s*, *f* it represented a nasalization of the preceding vowel—perhaps accompanied by lengthening:

cum judice = ɑɪʃ ɷɪ·ϖʃɑ[,
cum virtute = ɑɪʃ ɜʃωʃɒɪ·ɒ[,
cum silentio = ɑɪʃ sʃϖ[ℸɒʃ}·,
cum falcibus = ɑɪʃ >]ϖɑʃɓɪs.

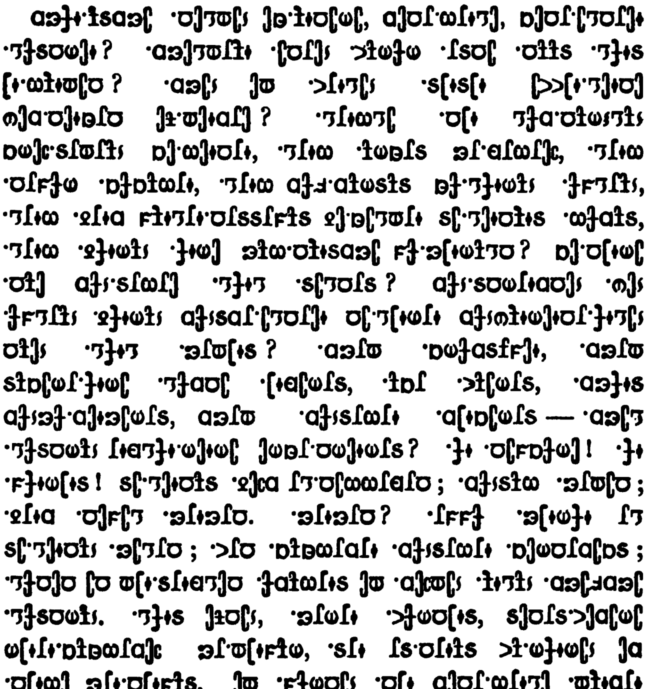
So also before a pause, or before a vowel (or vowel preceded by *h*), where the vowel was slurred in metre:

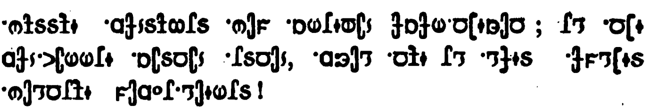
caput magnum = ɑ]ɓɪɒ ꜰ]ɐℸɪʃ,
magnum opus = { ꜰ]ɐℸɪʃ / ꜰ]ɐℸɪɪʃ } }ɑɪs.

The *m* of *com-*, etc. in composition was treated in the same way, as in *concremāre*, *consistere* = , .

The voiceless stops were followed by a voice-glide, as in French and Italian: *capita* = . Voice-stops had full voice initially, as in French.

SPECIMEN.

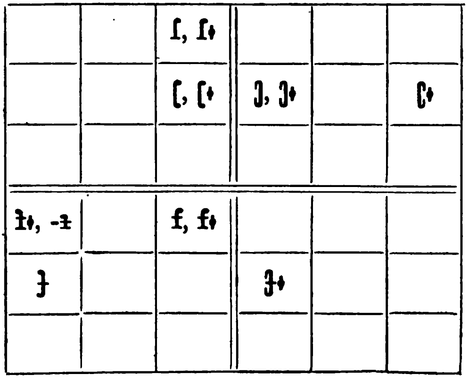




Qvousqve tandem abutere, Catilina, patientia nostra? Qvandiu etiam furor iste tuus nos eludet? Qvem ad finem sese effrenata jactabit audacia? Nilne te nocturnum praesidium palati, nil urbis vigiliae, nil timor populi, nil concursus bonorum omnium, nil hic munitissimus habendi senatus locus, nil horum ora vultusque moverunt? Patere tua consilia non sentis? Constrictam jam omnium horum conscientia teneri conjurationem tuam non vides? Qvid proxima, qvid superiore nocte egeris, ubi fueris, qvos convocaveris, quid consili ceperis—qvem nostrum ignorare arbitraris? O tempora! O mores! Senatus haec intelligit; consul videt; hic tamen vivit. Vivit? Immo vero in senatum venit; fit publici consili particeps; notat et designat oculis ad caedem unum qvenqve nostrum. Nos autem, viri fortes, satisfacere reipublicae videmur, si istius furorem ac tela vitemus. Ad mortem te Catilina duci jussu consulis jam pridem oportebat; in te conferri pestem istam, qvam tu in nos omnes jamdiu machinaris!

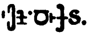
GREEK.

Vowels.

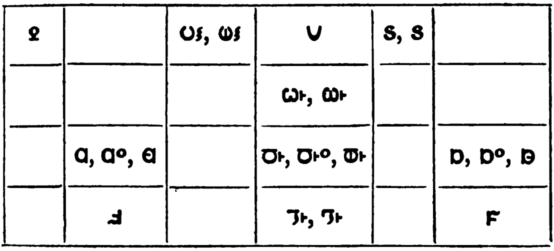


a =] *as in* hárma.
ai =]ɾ „ paîs.
au =]ǂ „ autós.
ā =]ɨ „ prâxis.
āi =]ɨc „ khṓrāi.
e = [„ egéneto.
ei = [ɨ „ leípō.
eu = [ǂ „ basileús.
ē = ⌈ɨ „ alēthḗs.
ēi = ⌈ɨc „ pêi.

ēu = *as in* ēuxanómēn.
i = „ híppos.
ī = „ krínō.
o = „ dómos.
oi = „ oîkos.
ou = „ hoûtos.
ō = „ dôma.
ōi = „ ōidḗ.
u = „ túptō.
ui = „ muîa.
ū = „ sûkon.

Vowels began with the clear beginning (119 b): 

CONSONANTS.



b = *as in* bradús.
d = „ dídōmi.
g = „ ágō.
gg = „ ággelos.
h = „ híppos.
k = „ kakós.
kh = „ kheír.

l = ɷ• *as in* légō.
m = ꜰ „ mâllon.
n = Ʒ• „ nûn.
p = ɒ „ paîs.
ph = ɒ° „ sophíā.
r = ω𝔰 „ éris.
rh = ʊ𝔰 „ rheûma.
s = s, s „ { skótos. / sbénnūmi.
t = ʊ• „ tóte.
tt (ss) = ɯ „ táttō.
th = ʊ° „ títhēmi.
x = ɑs „ dóxa.
z = ɷs „ zugón.

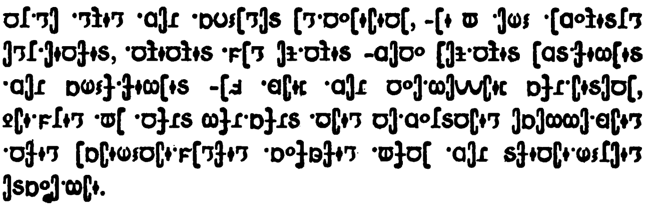
Voiced consonants were unvoiced after the aspirates *kh*, *th*, *ph*, the aspiration passing into them, as in *khrónos* ·ɑʊ𝔰}Ʒ}s, *phloîsbos* ·ɒω}ɪsɵ}s, *thnḗskō* ·ʊƷ[•sɑ}•.

SYNTHESIS.

The Greek synthesis and organic basis was probably similar to that of the languages of Southern Europe now. Voice stops were fully vocalized, voiceless unaspirated stops were followed by a voice glide as in *títhēmi* ·ʊ'ɪʊ°[•ꜰɪ.

SPECIMEN.

·ꜰ[• ·ɷ[•ʊ, ·}• ·ɒ]Ʒʊ[s ʊ°[·}ɪ, ꜰ[•·ɷ[•s ·ʊ]±ʊ° ɪ•·ꜰ}•Ʒ
[ɒɪ·Ʒ[±s[•[Ʒ,]ω·ω] ·ꜰ]ωɪsʊ] ·ꜰ[Ʒ ·ɑ]ɪ ·ʊɪ•ʊ}ɪs ɵ[ω·ʊɪ}•



Mè dêt’, ô pántes theoì, mēdeìs taûth’ ūmôn epineúseien, allà málista mèn kaì toútois beltíō tinà noûn kaì phrénas entheíēte, ei d’ ár’ ékhousin aniátōs, toútous mèn autoùs kath’ eautoùs exóleis kaì proóleis en gêi kaì thaláttēi poiésate, hēmîn dè toîs loipoîs tèn takhístēn apallagèn tôn epērtēménōn phóbōn dóte kaì sōtēríān asphalê.

APPENDIX.

List of Symbols.

(The references are to the paragraphs.)

xı stop modifier 69 c.
x] syllabic modifier 150.
I voice, voice-glide 26.
I̵ voice-glide rounded.
1 vowel 50.
1̵ ,, =Fr. *ou* 50.
1 ,, 50.
1̵ ,, in *put* 50.
] ,, in *but* 50.
]̵ ,, in G. *so* 50.
J ,, in *far* 50.
J̵ ,, in *no* 50.
J ,, 50.
J̵ ,, in *all* 50.
J ,, 50.
J̵ ,, in *not* 50.
I ,, 50.
I̵ ,, 50.
T ,, 50.
T̵ ,, in *value* (second vowel) 50.

l vowel in G. *gabe* (second vowel) 50.
l̵ ,, 50.
l ,, in *better* (second vowel) 50.
l̵ ,, 50.
I ,, in *err* 50.
I̵ ,, 50.
I ,, in *how* 50.
I̵ ,, 50.
ſ ,, =Fr. *i* 50.
f ,, =Fr. *u* 50.
ſ ,, in *it* 50.
f ,, 50.
[,, =Fr. *é* 50.
[̵ ,, in Fr. *peu* 50.
[,, in *men* 50.
[̵ ,, 50.
l ,, in *air* 50.
l̵ ,, 50.
l ,, in *man* 50.

ɪ vowel 50.
ı etc. glide-ı etc. 115.
x♦ long 97.
x⬩ half-long (medium) 97.
x◊ short 97.
x‖ open modifier 69 a. spreader 41.
x= level force 103.
'x clear vowel-glide 119 b, 121 b.
x' voice-glide 125.
x¦ voice modifier 26, 66.
ˉx level tone 162.
-x weak stress 108.
ˊx rising tone 162.
ˋx falling tone 162.
ʳx rising voice-leap 162. high key 169.
˖x falling voice-leap 162. low key 169.
x⊣ retracter, inner modifier 37, 73.
x⊦ advancer, outer modifier 37, 73.
x⊦⊦ interdental modifier 75.
x˔ raiser 37.
x˕ lowerer 37.
x+x link 72, 76.
x* general modifier.
x< increasing force 103.
x> diminishing force 103.
xʌ tenseness 70.
xv looseness 70.
x‹ in-breather 16, 89.
x◂ click modifier 90.
x› out-breather 16, 89.
ˇx compound rising tone 162.
ˆx compound falling tone 162.
ʼx weak stress 108.
ʻx open stress 159.
x∵ wide modifier 43, 66.
x∴ narrow modifier 43, 66.
xʃ nasality modifier 43, 69 d.
ʃɪ uvula stop consonant 78.
⅃ consonant 79.
⅃̵ „ in *sing* 79.
ɭ „ 79.
ɭ̵ „ =Ital. *gn* 79.
ℸ „ 79.
ℸ̵ „ =*n* 79.
ɾ „ 79.
ɾ̵ „ =*m* 79.
xʄ trill modifier 69 e.
o breath 25. basis for group-modifiers 100, 113, 172, 183.
x° aspirate 120, 129.
ϱ vowel-aspirate 120.

•x gradual vowel-glide 119a, 121a.
x• breath-glide 125.
x.x glideless modifier 143.
x: breath modifier 25, 48.
ˈx strong stress 108.
:x medium stress 108.
;x extra strong stress 108.
c consonant in G. *ach* 79.
є ,, in G. *sage* 79.
∩ ,, in G. *ich* 79.
⋒ ,, in *you* 79.
ᴗ ,, 79.
ω ,, =*r* 79.
ɔ ,, 79.
э ,, 79.
ɕ ,, in G. *auch* 79.
ɛ ,, 79.
ↄ ,, =*wh* 79.
ɜ ,, =*w* 79.
ɑ ,, =*k* 79.
ɒ ,, =*g* 79.
Ω ,, 79.
ɷ ,, 79.
℧ ,, =*t* 79.
ϖ ,, =*d* 79.
D ,, =*p* 79.
Ð ,, =*b* 79.
∪ ,, in *thin* 79.
⋓ consonant in *then* 79.
> ,, =*f* 79.
⋗ ,, =*v* 79.
ε ,, 79.
ȝ ,, 79.
ʗ ,, 79.
ꝏ ,, =Ital. *gl* 79.
ɯ ,, 79.
ꞷ ,, =*l* 79.
з ,, 79.
ʒ ,, 79.
x(back modifier 71a.
x\ front modifier 71b.
x⧵ point modifier 47, 71c.
x) rounder (lip modifier) 39.
x) non-syllabic modifier 115, 150.
xᶜ inverter 71c.
xↄ protruder 40, 71c.
ӿ glottal stop 30.
xʃ blade modifier 71d.
x⊃ inner rounder (lip-back modifier) 39.
ɵ whisper 27.
ɵʃ consonant 79.
◗ whisper modifier 27, 49, 65.
ɿ throat-stop modifier 130.

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